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IN
NUMBERLAND

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First Journeys in Numberland

BY

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DEDICATION

To the Children, north, south, east, and west,
who have been our inspiration, and for
whom it has been a privilege
and a blessing to work

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INTRODUCTION

By watching the four or five year old child as he moves about the home, tapping and counting the tables, chairs. and his toys, and expressing his counts, one will recognize the reality of the *numbering* instinct and the intense pleasure of the child in the natural impulse to express it. The child's interest in acts of *measuring* reveals itself with equal strength when the means are supplied and he is shown how to set about the work. For a time the pleasure he takes in the mere activities of the counting, measuring, and grouping is a satisfying end in itself. These activities are rhythmical and it is perhaps this characteristic that produces the pleasure. As a rhythmic stanza or melody is readily held in mind, so are rhythmically ordered, grouped, or measured ideas economically learned. This brings us to the first principle, viz.:

Numbering is the mind's economic way of ordering, measuring, and grouping things for use.

By the time the child enters the public school he feels the crudeness of his attempts to express himself in the language of numbers and is eager for help. At this point attention to his number interests should become systematic, and definite instruction should begin. How this early and fundamental instruction shall be given is the vital question. The best way must be the most natural way. Hence a second principle for guidance is:

Power and skill in numbering are most economically gained through the natural activities of ordering, measuring, and grouping things.

The degree of benefit derived by young children from number study in school depends on two things, viz.:

1. They must themselves feel the reality or the genuineness of the work they are asked to do.
2. They must feel a need for the number work.

The most effectual mode of leading them to the desired goal is through the employment of material that seems of value to them. The question of interest falls back on the question of subject-matter, because successful teaching of a subject-matter means the begetting and maintaining of a lively interest in it. The material used at this point in the curriculum must be not only concrete, but it must be of the child's kind of concreteness.

The strongest appeal to the child that number work can make arises through the skillful employment of objects of the child's own world.

The child's numberland that is, or may readily be made, available for mathematical uses in the school room, consists of toys, plays, games; exercises in making, cutting, folding, modeling; vague number facts gained in the home, or kindergarten; simple facts as to the relative values of coins; rhythmic countings; indefinite comparisons of relative heights, distances, and sizes, etc.

It is with the thought of starting the child's mathematical education by guiding his first journeys along pleasant and fruitful paths to a profitable number outcome, that the authors have prepared this book.

The general plan of dealing with the material is suggested by these principles:

1. The natural procedure is to begin with exercises in indefinite comparison of sizes of simple objects, both to lay a basis for definite comparison (measuring and numbering), and to establish a feeling of need for the more accurate work.

2. The true pedagogical order is to begin with numbers applied to tangible and present things; to proceed to numbers applied to familiar but absent things, and lastly to abstract numbers.

If the work of mathematical instruction were carried on through the succeeding years of the elementary school with as much regard to the learner's needs, interests, and possibilities, as it is carried through this little book, it is believed that we might hope soon to realize in a measure the real aim of public elementary school mathematics, viz.:

To convert the number instinct and the impulse of the child to express it, into working instruments, capable of being used with design and pleasure.

One educational writer has urged that *counting* is the correct basis for number teaching; another that *measurement* is the rational basis; and still another that *grouping* and *groups* form the psychological basis. The development found in this book proceeds on the theory that no one of these is the exclusive basis; but that each has an important service to render in the genesis and evolution of numbers and of number processes. All are given important attention and as a result the number power and skill developed by the plan of the book is symmetrical, well balanced, and complete. It is a rare distinction in a number primer, therefore, to be able to claim on the evidence of high educational authority, that it is at once *correct, rational*, and *psychological.*

GEORGE W. MYERS.

TEACHING SUGGESTIONS

These first journeys in numberland are intended for the first and second grades. Perhaps the best time to take up the work with classes is about the middle of the first school year. Through the first dozen pages the teacher should read the questions slowly and distinctly while the pupils keep their eyes on the page and answer. On completing each page of questions, call the attention of the pupils to the new words, especially where they are printed in heavy type at the foot of the page. These words should be carefully spoken first by the teacher and thereafter by individual pupils. Do not hurry the children but give them ample time to get the meaning of the questions, and to formulate their answers.

Page 21 is merely to acquaint the pupil with the foot-rule and the distance, or stretch of one foot. Let the attention of the children be on the foot-rule as a whole, and not as made up of inches. This page is sufficiently amplified for a first acquaintance with the idea of one foot. Go carefully over the page just as it is given.

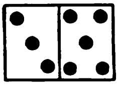
Page 22 undertakes to make clear the meaning of measuring and the way it is to be done. The thought is not precision of result, but clearness as to the method to be used. It is not superfluous for the pupil first to fill the length to be measured with foot-rules, and then to see that one foot-rule is sufficient for the measuring work by putting it down and taking it up repeatedly. It may be thought desirable to measure other things than those specified on this page, but it will be noted that three pages of similar work follow and this plan of the book perhaps calls for enough of the exercise for one time. A number of paper strips, one, two, three, and four feet long should be prepared for class use before page 24 is read.

Have the children make the cards for the matching game on page 26. The teacher should have ready a supply of material for this purpose. Making the cards and learning the game is the best part of the exercise. Once in a while, on subsequent days, for the sake of relaxation and review, it will be well to have the children play the game for a part of a class exercise. This will familiarize them with the names, symbols, and groups for the numbers involved. The symmetrical domino arrangements have a special value as showing the children that it is easy to know how many there are in a larger group, when it is arranged in smaller groups.

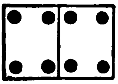
As number truths are worked out from time to time in the progress of the work, the children should record them for future use in the number book, as suggested on page 27. Both the writing down of the newly acquired fact and the use of the record for reference for a time, have a high teaching value. Furthermore, as the facts accumulate, the need for gathering them together into tables is made impressive. The writing down of the addition table and parts of the multiplication table may well be done as a means of making the number book handier for reference.

Do not slight the *making* exercises that follow here for several pages. Yet it is unwise to insist on too great precision. The child who has done his best should be commended if he has fully grasped the idea of the construction.

There are several pages in the book, like pages 53 and 66, that are intended to gather into small summaries the formal number truths the child has worked out in the body of the book. These pages are not intended to be complete. Enough is done on them to show how the facts should be treated and to indicate fairly well the scope intended. Limitations of space have prevented the insertion of much that was desirable in the book, and as formal facts are readily gathered by the teacher under the impulse of the moment, it seemed best to present suggestive rather than complete treatments on these synoptical pages. Teachers will be acting in harmony with the thought of the authors if they supply formal facts, and adapt, and rearrange what is there to suit their own special purposes and plans. Some of the problem pages, also, such as 68, 95 and 96 are incomplete because of space limitations. These should be supplemented by the teacher, in actual use.

As an illustration of what might be done on page 67 with any one of the domino arrangements of dots on the page, as for example  the following is suggested. Draw on the blackboard several of the various symmetrical sub-groups making 8, as follows:

(1)



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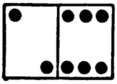

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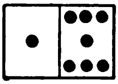

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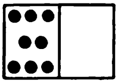

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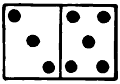


The pupil might be asked to write out as associated with (1) the following forms: 4 and 4 make 8, 4 + 4 = 8, 2 fours are 8, 2 × 4 = 8, 4 twos are 8, 4 × 2 = 8, ½ of 8 is 4, ½ of 8 = 4, 8 divided by 2 is 4, 8 ÷ 2 = 4, 8 — 4 = 4, etc.

In the same way he should write out the similar expressions of the truths visualized in (2), (3), (4), and (5). This furnishes a clear idea of 8 by defining it as made up of two groups of smaller numbers and is immensely richer than the customary 7 and 1 merely. A body of experiences is thus accumulated, on the basis of which, the teacher may say when she chooses, "What we were doing when we put 3 and 5 together to make 8 is called adding, or addition." No better way of teaching or of defining the process of addition has yet been suggested.

Throughout the book will be found exercises for special days. These are to be given when occasion requires and not according to order of arrangement.

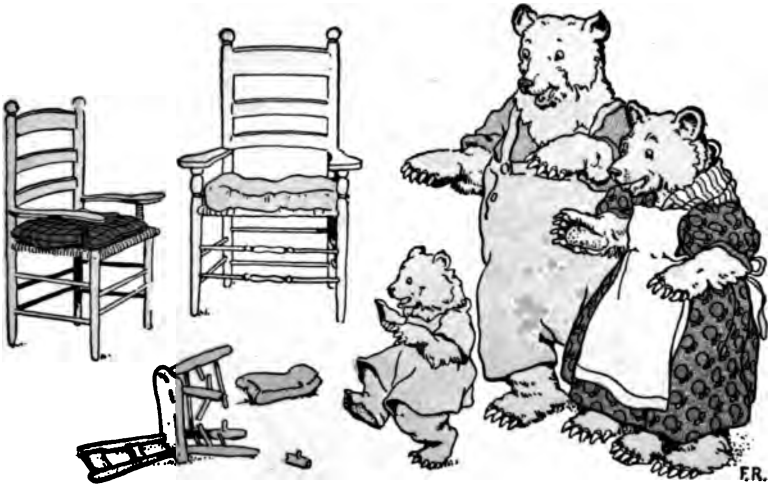
Many supplementary facts will be suggested to the teacher as desirable on page 87. Set the clock at the time school begins in the morning, at the time for noon intermission, at the time for afternoon dismissal, etc.

Let the children actually play store as suggested on pages 102, 114, 120, 122, 129, and 137. A table in one corner of the school room, a price list written by the teacher on the black-board, stock brought in by the pupils, and toy money are all that is needed. A "treasure box" into which horse-chestnuts, acorns, cones, smooth stones, discarded small toys, etc., have been dropped from time to time by the children will furnish material for store keeping. Their vivid imaginations will glorify the meanest objects. Today the stones may be used as eggs or potatoes for a grocery; tomorrow they may serve as lemons or oranges on a fruit stand; the next day they may represent delicious cakes in a bakery. When one "store keeper" gives incorrect measurement or change let another take his place.

"The Child Welfare" promoters advocate the "do-with" kind of toys. One of the notable features of this book is its "do-with" material. The child need not accept a number fact on faith, but he can actually work it out and live through it until the knowledge becomes his by right of exploration and conquest.

THE AUTHORS

One, two, three, four, five!
I caught a hare alive;
Six, seven, eight, nine, ten!
I let her go again.



1. Which is the tallest bear?
2. Which is the shortest bear?
3. Which is taller, papa bear or mamma bear?
4. Which is shorter, mamma bear or baby bear?
5. Which chair is the highest?
6. Which chair is the lowest?
7. Which is higher, papa bear's chair or mamma bear's chair?
8. Which is lower, mamma bear's chair or baby bear's chair?

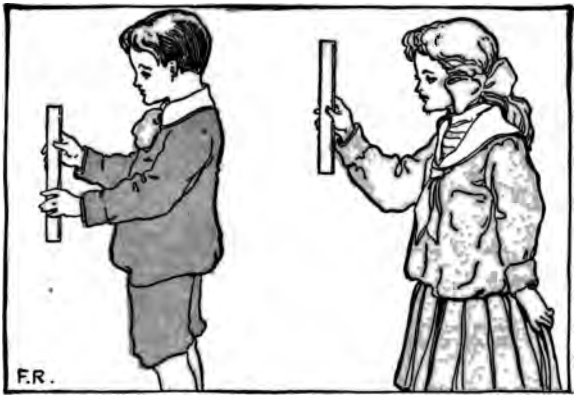
TALLER	SHORTER	HIGHER	LOWER
TALLEST	SHORTEST	HIGHEST	LOWEST

1. Which cushion is the largest?
2. Which cushion is the smallest?
3. Which cushions are larger than the blue cushion?
4. Which cushions are smaller than the cushion on papa bear's chair?
5. Which bear has the smallest ears?
6. Which are larger, papa bear's ears or baby bear's ears?
7. Which are smaller, mamma bear's ears or baby bear's ears?
8. Who is the tallest boy in your class?
9. Who is the shortest boy in the class?
10. Who is the tallest girl?
11. Who is the shortest girl?
12. Which is taller, the tallest boy or the tallest girl?
13. Which is shorter, the shortest boy or the shortest girl?
14. Which is longer, your pencil or your ruler?
15. Which is longest, your pencil, your ruler, or this book?

LARGER	**SMALLER**	**LONGER**
LARGEST	**SMALLEST**	**LONGEST**

1. In your school room which is higher, the top of the blackboard or the top of the door?
2. Which is lower, the teacher's chair or your chair?
3. Which is higher, the teacher's desk or your desk?
4. Which is longer, the teacher's desk or your desk?
5. Which is the largest of all the pictures on the wall?
6. Which is the smallest of all the pictures on the wall?
7. Which picture in your school room is nearest to the ceiling?
8. Which is nearer your desk, a door or a window?
9. Which is higher, the top of the door or the top of the window?
10. Which is longer, a piece of chalk or your pencil?
11. Which is shorter, your pencil or this book?
12. Which is wider, this book or your reading book?
13. Which is the widest of all the books on your desk?

NEARER NEAREST WIDER WIDEST



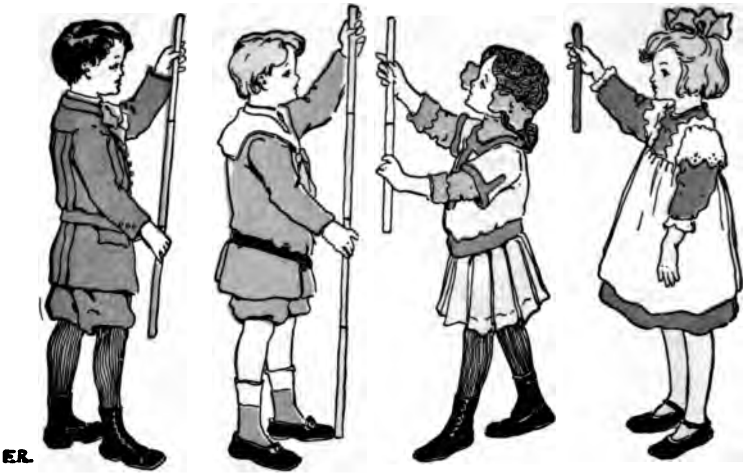
1. Hold up your rulers to see if they are all the same length.
2. Each ruler is one foot long.
3. Cut a strip of paper one foot long.
4. With your ruler, draw on the blackboard a line one foot long.
5. Erase. Now draw on the board a line one foot long, without your ruler.
6. Measure with your ruler or paper strip to see if the line is just one foot long.
7. Can you find anything in the room about one foot long?
8. Find three things in the room that are about one foot long.

ONE FOOT 1 FOOT FOOT RULE

FINDING HOW TALL YOU ARE

1. Stand against the blackboard. Make a mark on the board even with the top of your head.
2. With a piece of string, measure from the floor to this mark.
3. Pin the string to the floor. Place on it foot rules, end to end. How many rules do you need to cover the string from pin to pin?
4. The string is how many foot rules long?
5. Now measure it with only one ruler. Place the ruler on the string and make a mark at the end of it. From this mark measure the length of the ruler and make another mark at the end of it. Mark off all the string in this way. How many feet long is it? About how tall are you?

1. Without using the ruler, place on the board two chalk marks as nearly three feet apart as you can.
2. Measure with the ruler to see if the marks are three feet apart.
3. Without using the ruler, draw a three foot line. Measure to see if the line really is three feet long.
4. Now using your ruler, make the line just three feet long.
5. One foot and one foot and one foot are —— feet.
6. Using your ruler, erase two feet of the line. Measure the part which is left. How long is it?
7. Three feet less two feet is —— foot.
8. Two feet and one foot are —— feet.
9. With your ruler, draw a two foot line. Draw another two foot line.
10. How many feet are there in both lines?
11. Two two foot lines are —— feet long.
12. Using the ruler, draw a line four feet long.
13. Using the ruler, draw a line three feet long. Draw another line one foot long. How many feet are there in both lines?
14. Three feet and one foot are —— feet.
15. Four feet less three feet is —— foot.

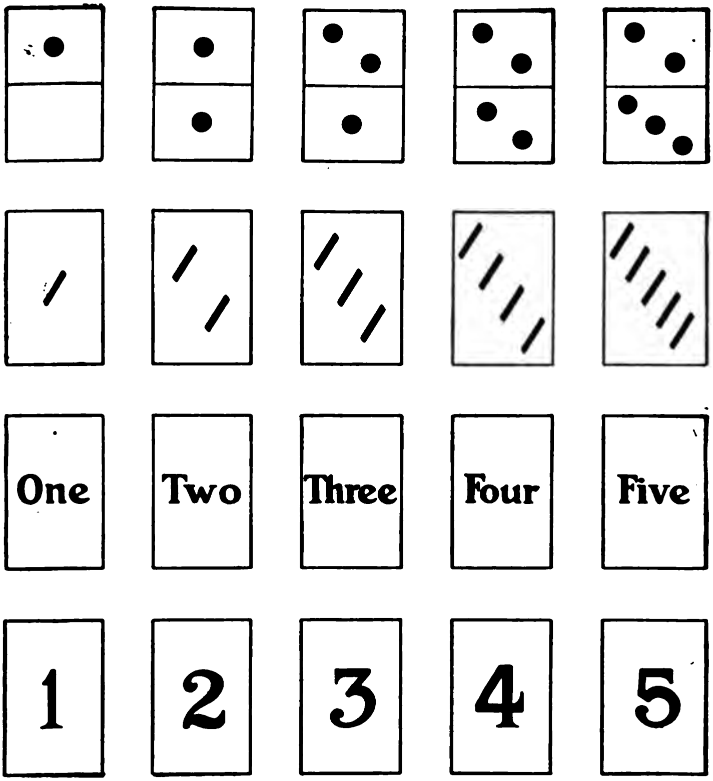


1. Four children stand.
2. The first child may find a strip of paper one foot long.
3. Which child in the picture has a one foot strip?
4. The second child may find a strip two times as long.
5. Which child in the picture has a two foot strip?
6. The third child may find a strip two times as long as the two foot strip.
7. Which child in the picture has a four foot strip?
8. The fourth child may find a strip one foot shorter than the four foot strip. How long is it?

ONE TWO THREE FOUR

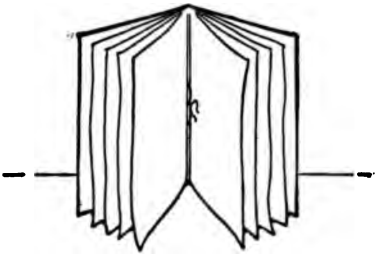
FIRST SECOND THIRD FOURTH

1. How many feet long do you think the teacher's desk is?
2. Measure to see if you are right.
3. How wide do you think it is?
4. Measure to see if you are right.
5. How wide do you think your own desk is?
6. Measure to see how nearly right you are.
7. How high do you think it is?
8. Measure to see if you are right.
9. Which do you think is the wider, the door or the window?
10. Measure to see which is the wider.
11. How many feet do you think it is from the floor to the blackboard?
12. Measure to see how many feet it is.
13. How long do you think the teacher's pointer is?
14. Measure the pointer to see how nearly right you are.
15. With a piece of chalk in each hand, stretch your arms as far apart as you can and make two marks on the board.
16. Measure the distance between the marks on the board to see how far apart you can stretch your hands.
17. What can you measure at home? If you have a jumping-rope or a top-string at home, measure it to see how long it is.



MATCHING GAME

1. From pad backs make cards like these.
2. Each pupil keeps one card.
3. One child stands before the class and shows his card.
4. All children who have the same number in other forms, stand beside the first child and show their cards to the class.



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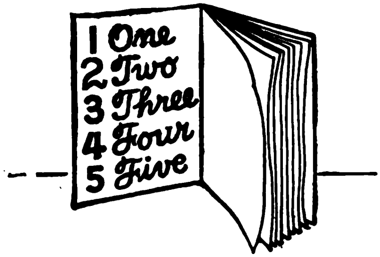
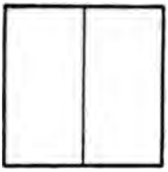


(2)

MAKING A NUMBER BOOK

1. Take four sheets of paper for the inside of the number book and one sheet of heavier paper for the cover.
2. Put the short edges of each sheet together and crease through the middle.
3. Open the sheets and place them one upon another, putting the heavier sheet of paper on the outside.
4. Tie the sheets together with string or ribbon as in picture (1).
5. Cut the figures from an old calendar. Paste the figures from one to five in the book as in picture (2). As you learn new figures, paste them in the book.
6. After each figure write its name as in picture (2).

(1)



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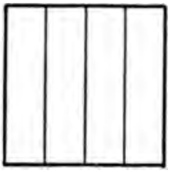

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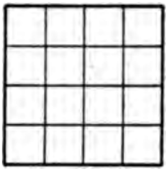

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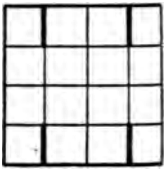

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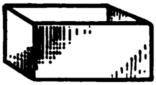
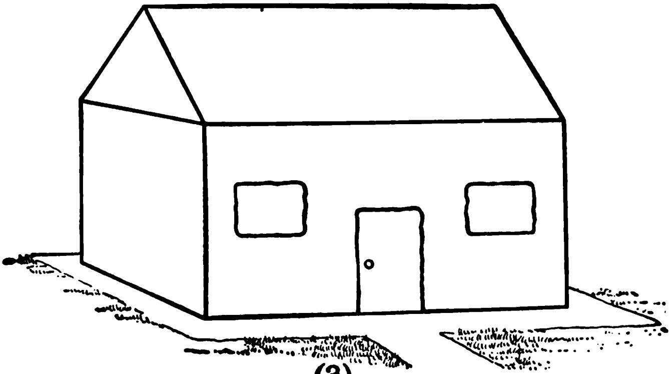


MAKING A BOX

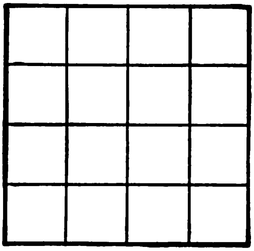
1. Make a box to hold the figures you cut out, until you paste them in your number book.
2. Cut a piece of paper one foot square.
3. Fold it so that two edges meet. Crease as in picture (1).
4. Open the sheet. Fold one edge over to the crease. Fold the opposite edge over to the crease. Open as in picture (2).
5. Fold the other two edges of the square together. Crease.
6. Fold each of these two edges to the crease. Open as in picture (3).
7. Cut along one side of each corner square as shown by the heavy lines in picture (4).
8. Fold into shape with the corner squares inside. Paste each corner square to the square back of it. The box now looks like picture (5).



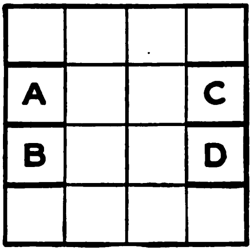
(3)

MAKING A PAPER HOUSE

1. Cut a piece of paper one foot square.
2. Fold the paper into four rows of small squares as you did in making the box. See picture (1).
3. Cut along the heavy lines as in picture (2).
4. Paste square A to square B, and C to D, to make the roof of the house.
5. Bring the corner squares together to make the ends of the house. Cut door and windows. (3)

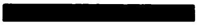


(1)

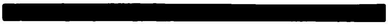


(2)

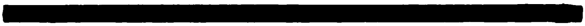
1. This line is ONE INCH long.



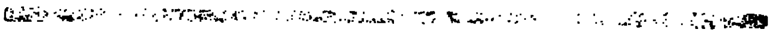
2. Show an inch on your foot rule.
3. Cut a strip of paper one inch long.
4. With this strip find how many inches long this black line is.



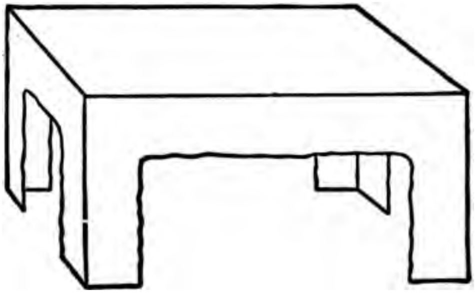
5. How many inches long is this green line?



6. How long is this blue line?



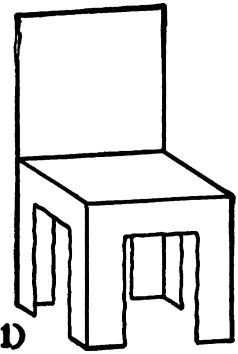
7. Cut a strip of paper two inches long. Cut another three inches long. Cut another four inches. Another five inches.
8. Put the four inch strip and the two inch strip end to end.
9. Count the inches in both strips. How many inches?
10. Now make six inches by putting end to end the one inch strip and the —— inch strip.
11. Cut a strip of paper six inches long.
12. Measure it with the two inch strip. How many two inches make six inches?
13. Measure the six inch strip with the three inch strip. How many three inches make six inches?



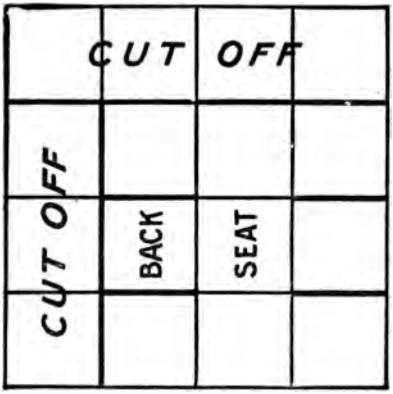
MAKING A TABLE

1. Here is a picture of a table. You may make a table like it for the paper house you made on page 29.
2. Cut a four inch square of white paper.
3. Make a box in the same way as you did on page 28.
4. Turn the box upside down and you have a table.
5. Now make legs for the table by cutting out a piece from each side of the box. See picture.
6. How long is the table top?
7. How wide is the table top?
8. How high is the table?

1. Place your foot rule on your desk.
2. Cut a six inch strip of paper. Cut a four inch strip. A three inch strip. A two inch strip.
3. Now measure the foot rule with the six inch strip.
   How many 6 inches make 1 foot?
4. Measure the ruler with the two inch strip of paper.
   How many 2 inches make 1 foot?
5. Measure the ruler with the four inch strip.
   How many 4 inches make 1 foot?
6. Measure the ruler with the three inch strip.
   How many 3 inches make 1 foot?
7. Count the inches on the ruler. How many?
8. There are —— inches in 1 foot.
9. 12 inches make —— ——
10. Two 6 inches are —— inches.
    Six 2 inches are —— inches.
11. Three 4 inches are —— inches.
    Four 3 inches are —— inches.
12. Measure the length of this page. How many inches long is it?
13. Measure the width of this page. How many inches wide is it?
14. Name two lines that together make a line 12 inches long.



(1)



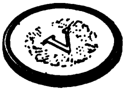
(2)

MAKING A CHAIR

1. Make a chair for your paper house. See (1).
2. Cut a four inch square from stiff paper.
3. Fold as you did to make the box.
4. Cut off one row of four small squares.
5. Cut off one row of three small squares.
6. How many squares are left?
7. Cut along the heavy lines as shown in picture (2).
8. Bend down the middle right hand square and paste the corner squares over it.
9. Bend up the middle left hand square for a back. Paste the corner squares together.
10. Cut legs as you did for the table.
11. How high is your chair back?
12. How high is your chair seat? How wide is it?

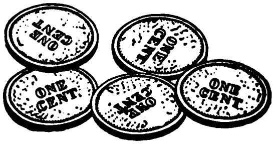
THE CENT AND THE NICKEL

1. Here is a picture of one side of a nickel.



2. Here is a picture of one side of a cent.

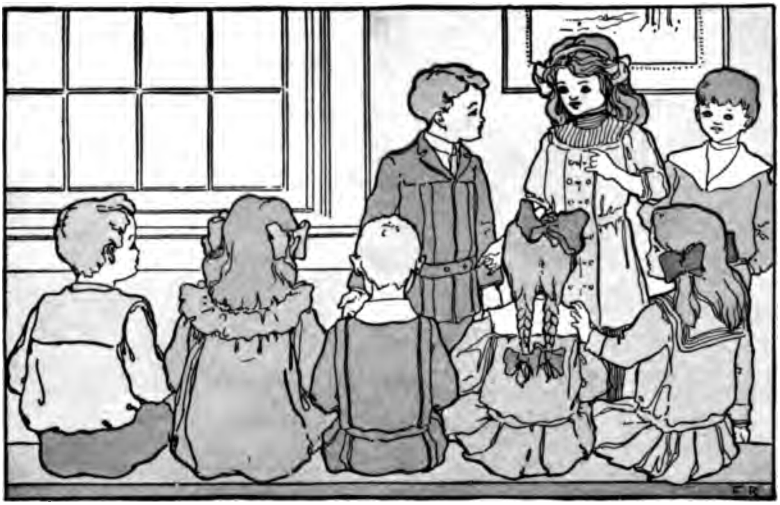
3. Here is a picture of —— cents.



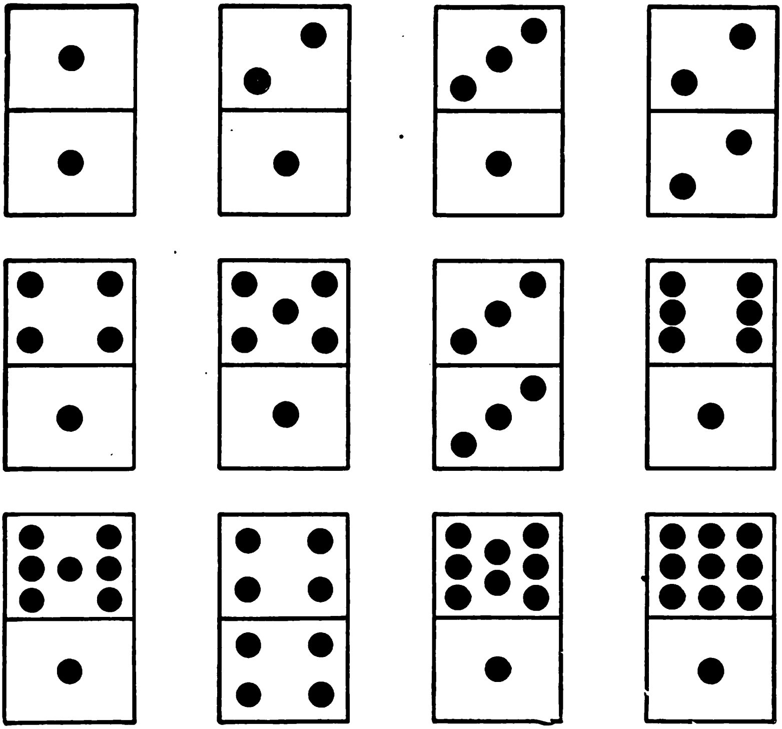
4. Five cents make a ——
5. How many cents in change will you get from a nickel after paying for a one cent stamp?
6. How many cents in change will you get from a nickel after paying for a two cent stamp?
7. How much change will you get from a nickel after paying for 3 one cent stamps?
8. How much change will you get from a nickel after paying for 2 two cent stamps?
9. Will you get any change from a nickel after you have paid for 3 one cent stamps and 1 two cent stamp?
10. How many one cent post cards can you buy for a nickel?
11. How many apples can you buy for a nickel if each apple costs one cent?

THE DIME

1. There are —— cents in one dime.
2. Count the two cents in a dime.
   —— two cents make 10 cents.
3. Count the five cents in one dime.
   —— five cents make 10 cents.
4. How many one cent stamps can you buy for a dime?
5. How many two cent stamps can you buy for a dime?
6. How many 5 cent pencils can you buy for a dime?
7. Divide 10 cents equally between 2 children. How many cents does each child get?
8. A nickel and one cent make —— cents.
9. A nickel and two cents make —— cents.
10. A nickel and three cents make —— cents.
11. A nickel and four cents make —— cents.
12. Two nickels make —— dime.



1. Count the boys on the bench. How many boys?
2. Count the girls on the bench. How many girls?
3. Count all the girls in the picture. How many?
4. Count all the children in the picture. How many children?
5. Count the windows in your school room. How many?
6. Count the panes in each window. How many?
7. Count the pictures in the room. How many?
8. Count the rows of seats. How many?
9. Count the seats in each row. How many?
10. Count the blackboard erasers. How many?

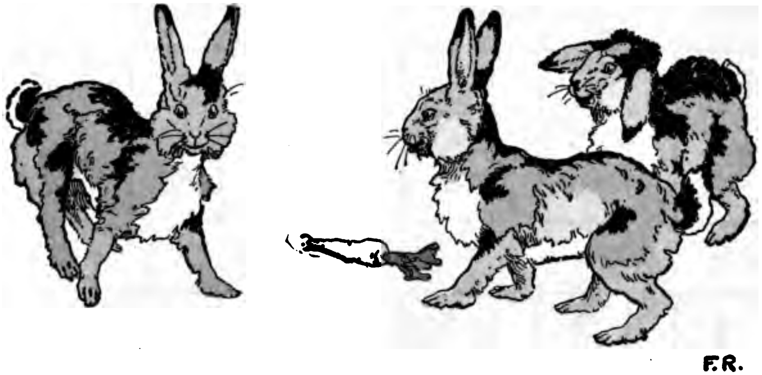


GROUPING GAME

1. Each child may make a card like one of these.
2. One pupil comes in front of the class and shows his card just long enough for all to see it clearly. Then he puts the card behind him and asks "How many?"
3. This is repeated with a different card each time until all the numbers have been used.

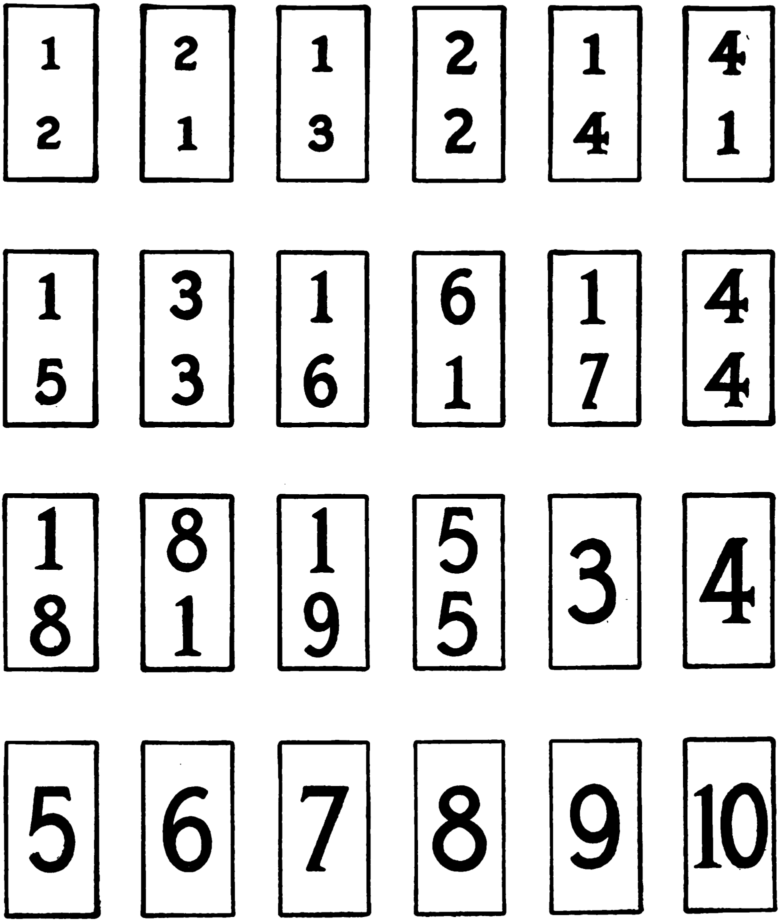
NUMBER STORIES

1. James had a hole in his pocket. He lost one cent in the morning and one cent in the afternoon. He lost —— cents.
2. He lost 2 marbles going to school and 2 marbles on his way home. He lost —— marbles.
3. Ada had 1 pencil. Her sister gave her 3 pencils. She then had —— pencils.
4. The teacher had 3 roses. Clara brought her 3 roses. She then had —— roses.
5. Arthur has 5 tops. George has 1 top. They have —— tops.
6. Ruth had 4 dolls. Santa brought her 1 doll. She now has —— dolls.
7. Charles had 7 dimes. His father gave him 1 dime. He then had —— dimes.
8. One cow is in a field. Eight more come in the field. There are then —— cows in the field.
9. Frank finds 6 eggs. Florence finds 1 egg. They find —— eggs.
10. Harry sold 9 papers. Tom sold 1 paper. They sold —— papers.
11. Baby slept 2 hours in the morning and 1 hour in the afternoon. In all she slept —— hours.

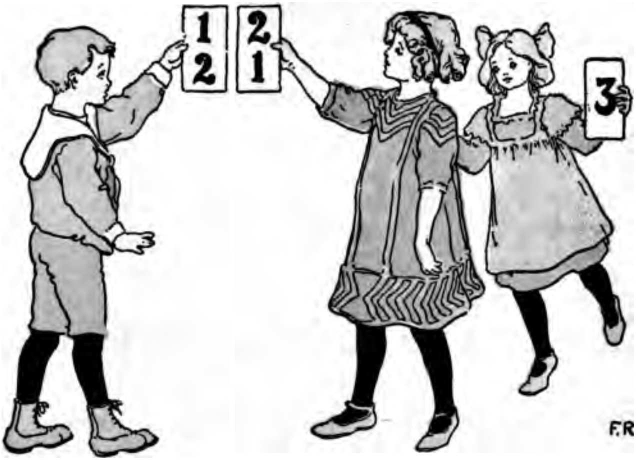


MAKING NUMBER STORIES

1. Make a number story about 1 rabbit and 2 rabbits.
2. Make a number story about 3 little birds and 1 big bird.
3. Make a number story about 1 cent and 1 cent.
4. Make a number story about 1 soldier and 4 soldiers.
5. Make a number story about 1 and 6.
6. Make a number story about 1 and 7.
7. Make a number story about 4 and 4.
8. Make a number story about 9 and 1.
9. Make a number story about 5 and 5.
10. Make a number story about 8 and 1.
11. Make a number story about 1 and 5.
12. Make a number story about 3 and 3.

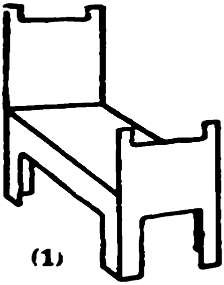


CARDS FOR THE ADDING GAME

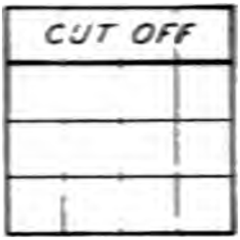


THE GAME OF ADDING

1. From cardboard make a card 8 inches long and 4 inches wide.
2. Write on the card one number or two numbers as shown on page 40.
3. Each pupil takes a card. A child who has a card with 2 numbers on it runs lightly to the front of the room and shows it to the class.
4. The child holding the card with numbers on it that make the same sum as the numbers on the first card runs and stands beside the first pupil.
5. The child holding the card with the sum on it runs lightly forward and shows it to the class.



(1)



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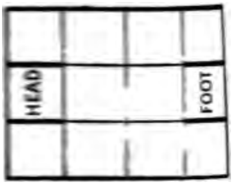
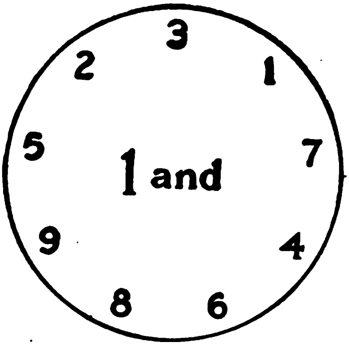


(3)

MAKING A BED FOR THE PAPER HOUSE

1. Your paper house must have a bed. Cut a five inch square from stiff paper.
2. Fold as you did for the box.
3. Cut off one row of squares as in picture (2). How many squares are left?
4. Cut along the four heavy lines as shown in picture (3).
5. Bend up the middle square at each short side. These squares will make the head and the foot of the bed.
6. Turn down the outside rows of squares to make the sides.
7. Paste the corner squares together as you did for the box.
8. Cut out legs as shown in picture (1).
9. Cut out posts at the head and the foot of the bed as shown in picture (1).



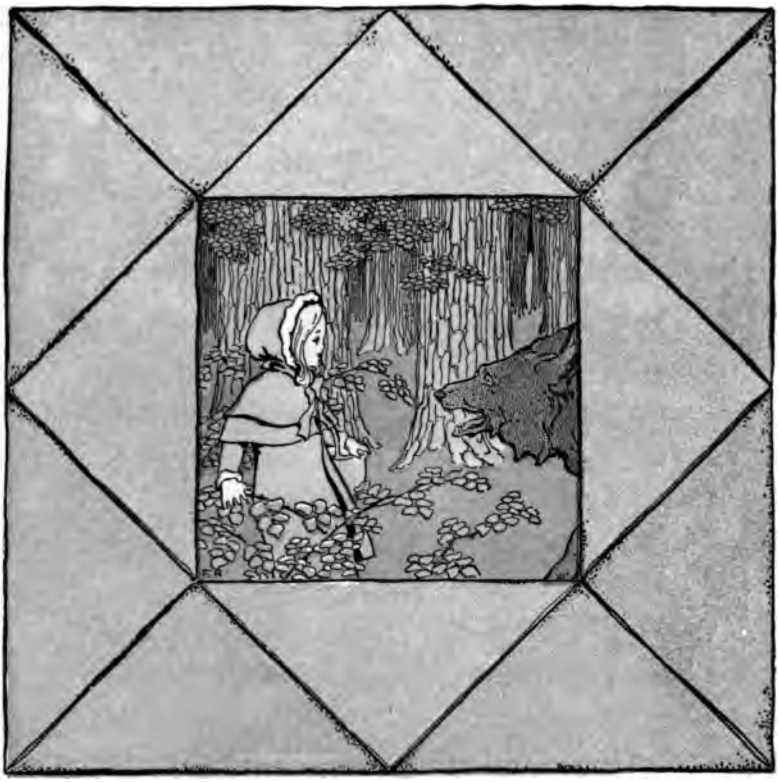
Put 1 with each number around the circle.

1 and 1 are ——
1 and 2 are ——
1 and 3 are ——
1 and 4 are ——
1 and 5 are ——
1 and 6 are ——
1 and 7 are ——
1 and 8 are ——
1 and 9 are ——

1 and —— are 8
1 and —— are 3
1 and —— are 5
1 and —— are 7
1 and —— are 4
1 and —— are 6
1 and —— are 9
1 and —— are 2
1 and —— are 10

1	1	1	2	1	1	1	1	1	3	1
4	2	3	2	1	8	6	7	5	3	9
—	—	—	—	—	—	—	—	—	—	—

1	6	3	7	4	5	2	4	8	9	5
1	1	1	1	4	1	1	1	1	1	5
—	—	—	—	—	—	—	—	—	—	—



PICTURE FRAME FOR MOTHER'S BIRTHDAY

MAKING A PICTURE FRAME FOR A BIRTHDAY GIFT

Dorothy made a pretty picture frame for her mother's birthday present.

She cut a 10 inch square from stiff green paper.

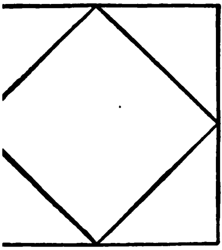
Then she measured 5 inches from each corner of the square and made a dot on each side.

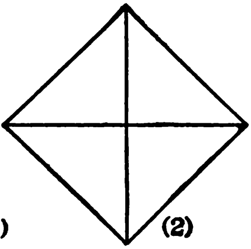
She drew lines joining the dots. See picture (1).

Next she folded each corner to the center of the square and creased along the lines. Her square now looked like picture (2).

Then she folded back the points until they touched the middle of the sides. The frame then looked like picture (3).

She put a little paste under each point, and placed the frame under some heavy books until it was dry. Mother thought the frame was beautiful and hung it in her room.


(1)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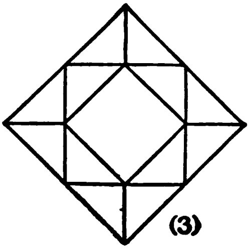

(3)

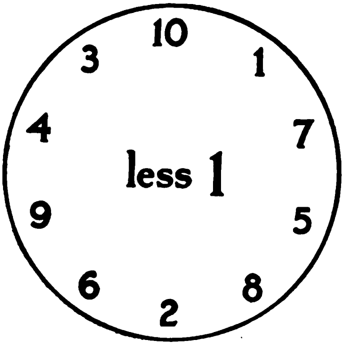
1. Make a row of three cubes. Take away one cube. How many are left? 1 cube from 3 cubes leaves —— cubes.
2. Make a row of 4 cubes. Take away 1 cube. How many are left? 1 cube from 4 cubes leaves —— cubes.
3. Make a row of 5 cubes. Take 1 cube away. How many cubes are left?
   1 cube from 5 cubes leaves —— cubes.
4. Make a row of 6 cubes. Take away one cube.
   1 cube from 6 cubes leaves —— cubes.
   3 cubes from 6 cubes leaves —— cubes.
5. Make a row of 7 cubes. Take away one cube.
   7 cubes less 1 cube are —— cubes.
6. From a row of 8 cubes take away 1 cube.
   8 cubes less 1 cube are —— cubes.
   8 cubes less 4 cubes are —— cubes.
7. From a row of 9 cubes take away one cube. How many cubes are left?
   9 cubes less 1 cube are —— cubes.
8. From a row of 10 cubes take away 1 cube. How many cubes are left?
   10 cubes less 1 cube are —— cubes.

NUMBER STORIES

1. John's kite tail was 6 feet long. 1 foot of it broke off. It was then —— feet long.
2. He let out 10 feet of string and pulled in 1 foot. He then had out —— feet of string.
3. Edith's sash was 7 feet long. She cut off 1 foot of it. It was then —— feet long.
4. Anna built a post with 9 cubes. 1 cube fell off. It was then —— cubes tall.
5. Ned had 5 cents. He spent 1 cent. He had —— cents left.
6. Charles drew a line 8 inches long. He erased 1 inch. It was then —— inches long.
7. Tom had 2 apples. He ate 1 apple. —— apple was left.
8. Baby slept for three hours and Mary slept one hour less. Mary slept —— hours.
9. A grocer had 4 boxes of nuts. He sold 1 box of them. He had —— boxes of nuts left.

MAKING NUMBER STORIES

1. Eight birds sat on a limb of a tree. 1 flew away. How many birds were left?
2. Tell a number story about 9 tops less 1 top.
3. Tell a number story about 10 roses less one rose.
4. Tell a number story about 5 dolls less 1 doll.
5. Tell a number story about 6 cups less 1 cup.
6. Tell a number story about 4 sticks of candy less 1 stick.
7. Tell a number story about 3 stamps less 1 stamp.
8. Tell a number story about 2 dimes less 1 dime.
9. Tell a number story about 7 ponies less 1 pony.



1. Take away 1 from each number around the circle.

2. 9 less —— is 8
6 less —— is 5
4 less —— is 3
7 less —— is 6
3 less —— is 2
8 less —— is 7
5 less —— is 4
2 less —— is 1
10 less —— is 9
1 less —— is 0

3. Take 1 from each number in the top row.

2	7	5	4	6	10	9	3	8	1
1	1	1	1	1	1	1	1	1	1
—	—	—	—	—	—	—	—	—	—

4. Take each number in the bottom row from the number just above it.

9	7	8	6	4	3	5	10	2
8	6	7	5	3	2	4	9	1
—	—	—	—	—	—	—	—	—

NUMBER GAME

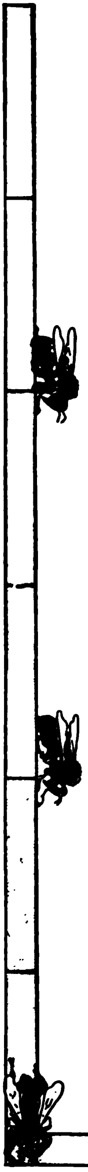
1. All the children form a circle around the teacher.
2. The teacher then passes quickly around the circle and asks one child at a time a question like one of these:

    8 and 1 are how many?
    2 and 2 make how many?
    6 less 1?
    8 less 4 is how many?
    4 and how many make 5?
    Add 3 to 1. How many?
    7, take away how many leaves 6?
    9 is how many more than 8?
    9 is how many less than 10?
    Take 5 from 6. How many?
    What must I put with 3 to make 4?
    What must I take from 6 to leave 5?
    How many are 4 and 4?
    Take 1 from 9. How many are left?

3. When the child who is called on cannot answer, or gives the wrong number, he must go inside the circle.
4. If the pupil who is inside the circle can answer any question more quickly than the child to whom the question is given, the two children change places.

REVIEW OF WORK WITH ONES

1. How many are 1 and 1? 2 less 1?
2. How many are 2 and 1? 3 less 1?
3. How many are 1 and 2? 3 less 2?
4. How many is 2 less 1?
5. How many are 3 and 1? 4 less 1?
6. How many are 1 and 3? 4 less 3?
7. How many is 3 less 1?
8. How many are 4 and 1? 5 less 1?
9. How many are 1 and 4? 5 less 4?
10. How many is 4 less 1?
11. How many are 5 and 1? 6 less 1?
12. How many are 1 and 5? 6 less 5?
13. How many is 5 less 1?
14. How many are 6 and 1? 7 less 1?
15. How many are 1 and 6? 7 less 6?
16. How many is 6 less 1?
17. How many are 7 and 1? 8 less 1?
18. How many are 1 and 7? 8 less 7?
19. How many is 7 less 1?
20. How many are 8 and 1? 9 less 1?
21. How many are 1 and 8? 9 less 8?
22. How many is 8 less 1?
23. How many are 9 and 1? 10 less 1?
24. How many are 1 and 9? 10 less 9?
25. How many is 9 less 1?



1. Draw 2 two inch lines. Count the inches on both. How many?
2 inches and 2 inches are —— inches.
2 two inches are —— inches.

2. Draw a 2 inch line. Draw a 3 inch line. Mark and count the inches. How many?
2 inches and 3 inches are —— inches.
3 inches and 2 inches are —— inches.

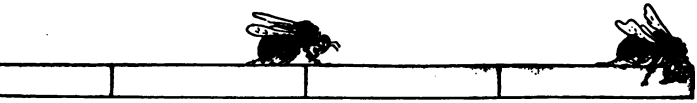
3. Draw a 2 inch line. Draw a 4 inch line. Mark the inches. How many inches?
2 inches and 4 inches are —— inches.
4 inches and 2 inches are —— inches.

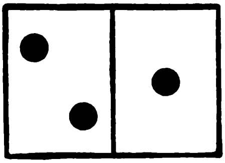
4. Draw a 2 inch line and a 5 inch line.
2 inches and 5 inches are —— inches.
5 inches and 2 inches are —— inches.

5. Draw a 2 inch line and a 6 inch line.
2 inches and 6 inches are —— inches.
6 inches and 2 inches are —— inches.

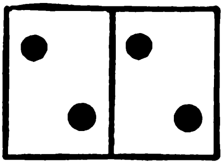
6. Draw a 2 inch line and a 7 inch line.
2 inches and 7 inches are —— inches.
7 inches and 2 inches are —— inches.

7. Draw a 2 inch line and an 8 inch line.
2 inches and 8 inches are —— inches.
8 inches and 2 inches are —— inches.

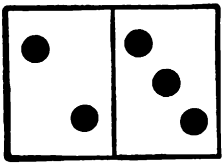




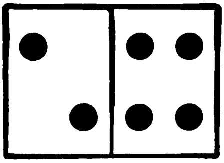
2 and 1 are ——
1 and 2 are ——
3 less 2 is ——
3 less 1 is ——



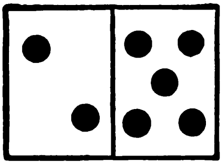
2 and 2 are ——
2 twos are ——
4 less 2 is ——



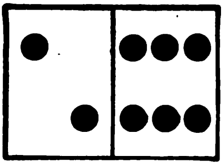
2 and 3 are ——
3 and 2 are ——
5 less 2 is ——
5 less 3 is ——



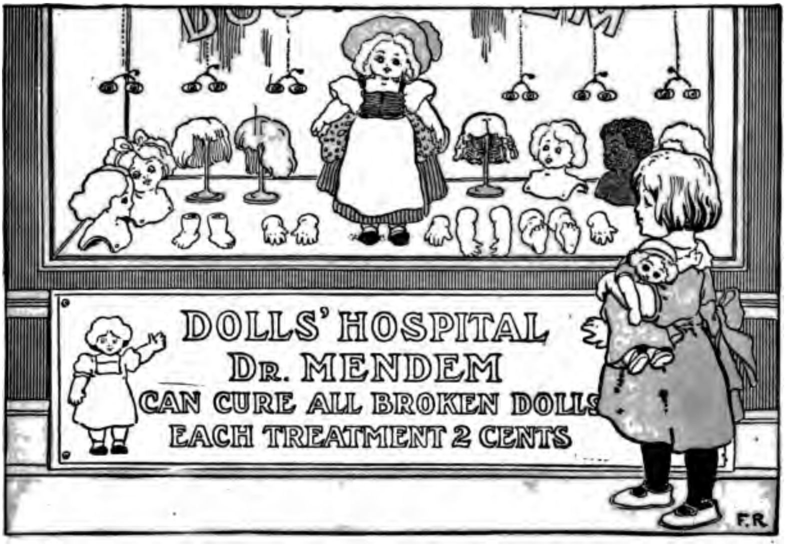
2 and 4 are ——
4 and 2 are ——
6 less 2 is ——
6 less 4 is ——



2 and 5 are ——
5 and 2 are ——
7 less 2 is ——
7 less 5 is ——



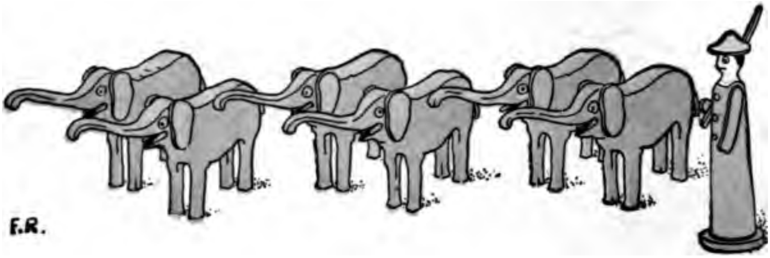
2 and 6 are ——
6 and 2 are ——
8 less 2 is ——
8 less 6 is ——



1. Ruth's best doll had a fall. The eyes fell out. Ruth took the poor doll to Doctor Mendem. He charged 5 cents for a new pair of eyes and 2 cents for putting them in. Ruth paid him 5 cents and 2 cents or —— cents.
2. Fido pulled the hair off the doll. Doctor Mendem charged Ruth 8 cents for new hair and 2 cents for putting it on the head. In all it cost —— cents.
3. Ruth took poor Dinah to Doctor Mendem because she had lost an arm. The arm was 4 cents and the *mending* was 2 cents. She paid —— cents.

DINAH LITTLE BOY BLUE THE CLOWN

4. Dinah needed a new nose. It was 3 cents. The mending was 2 cents. In all it cost —— cents.
5. Little Boy Blue lost a hand and a leg. The hand was 2 cents and the mending was 2 cents more, so Ruth paid —— cents.
6. The new leg was 7 cents and the mending was 2 cents. In all Doctor Mendem charged —— cents.
7. The Clown had a fall and his head came off. Ruth went again to Doctor Mendem. The new head cost 6 cents and the work 2 cents. She gave the Doctor —— cents.



NUMBER STORIES

1. Tell a number story about 2 elephants and 4 elephants.
2. Tell a number story about 2 big lions and 2 little lions.
3. Tell a number story about 2 black bears and 3 brown bears.
4. Tell a number story about 5 white horses and 2 black horses.
5. Tell a number story about 6 cows and 2 cows.
6. Tell a number story about 8 young dogs and 2 old dogs.
7. Tell a number story about 7 lambs and 2 lambs.
8. Tell a number story about the animal you like best.
9. Tell a number story about some of your best friends.

THE SIGN +

THE SIGN =

2 and 2 are 4

2 + 2 are 4

The sign + is used for the word "and."

Write these numbers using the sign + instead of the word "and."

2 and 3 are 5   2 and 5 are 7
2 and 4 are 6   2 and 7 are 9

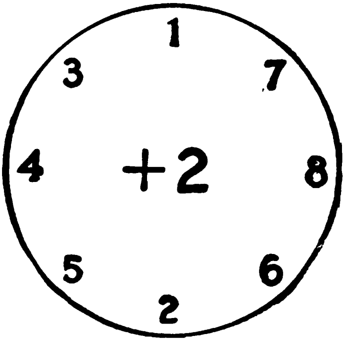
2 + 2 are 4

2 + 2 = 4

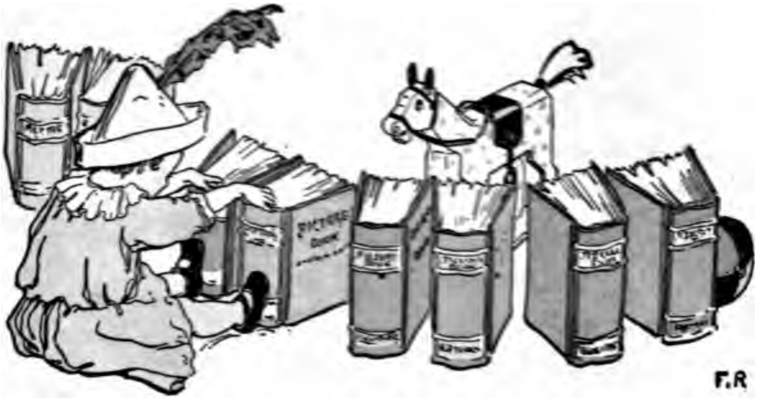
The sign = is used for the word "are."

Write these numbers using the signs + and = instead of the words "and" and "are."

2 and 5 are 7   7 and 2 are 9
2 and 6 are 8   8 and 2 are 10



Put 2 with each figure around the circle.



COUNTING BY TWOS

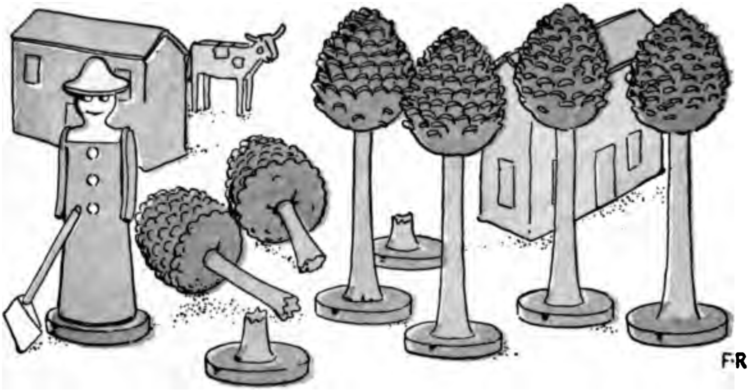
1. Read the numbers in blue figures.

   1, 2, 3, 4, 5, 6, 7, 8, 9, 10.
2. Count the books in the picture by twos.
3. Make a row of 6 cubes. Count them by 2's.
4. Count 10 desks. Now count them by twos. Touch them as you count.
5. Read the numbers in black figures.

   1, 2, 3, 4, 5, 6, 7, 8, 9, 10.
6. Beginning at 1, count 9 children by 2's. Touch them as you count.
7. Beginning at 1, count 9 cubes by 2's.
8. Counting by 2's, fill in the blanks.

   2, —, —, —, 10.
9. Fill in the blanks. 1, —, —, —, 9.

1. Using your ruler, draw on the blackboard a line 5 inches long. Erase 2 inches of it. How long a line is left?
   5 inches less 2 inches are —— inches.
2. Draw on the blackboard a line 10 inches long. Erase 2 inches of it. How long is the line you have left?
   10 inches less 2 inches are —— inches.
3. Draw on the board a line 8 inches long. Erase 2 inches of it. What is the length of the line that is left?
   8 inches less 2 inches are —— inches.
4. Draw on the board a line 7 inches long. Erase 2 inches of it. How many inches of the line are left?
   7 inches less 2 inches are —— inches.
5. Draw on the board a line 9 inches long. Erase 2 inches of it. How long is the part that is left?
   9 inches less 2 inches are —— inches.
6. Draw a line 6 inches less 2 inches long. How many inches in the line?
   6 inches less 2 inches are —— inches.
7. Draw a line 4 inches less 2 inches long. How many inches in the line?
   4 inches less 2 inches are —— inches.
8. Draw a line 3 inches less 2 inches long. How many inches in the line?
   3 inches less 2 inches are —— inch.



1. Six trees grew in Nursery Village. Two were cut down. How many were left standing?
2. Eight houses stood in the Village. A giant knocked over two. How many were left?
3. 10 tin soldiers lived in this Village. 2 went to war. How many were left at home?
4. 9 sheep fed on the grass in Nursery Village. 2 ran away. How many were left?
5. A train of 7 tin cars ran to the Village. 2 cars were smashed in a wreck. How many were left?
6. The Village had 5 firemen. 2 were hurt at a fire. How many were not hurt?
7. The Village had 4 policemen. 2 of them went to sleep. How many were awake?
8. There were 3 stores in Nursery Village. 2 stores sold candy. How many did not sell candy.

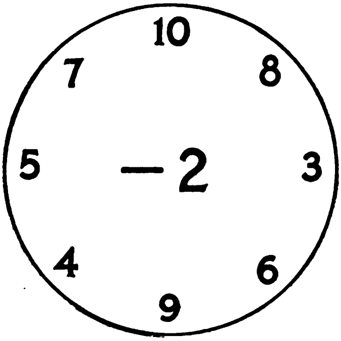
THE SIGN —

1. 4 less 2 is ——
5 less 2 is ——
10 less 2 is ——
8 less 2 is ——
6 less 2 is ——
7 less 2 is ——
9 — 2 is ——

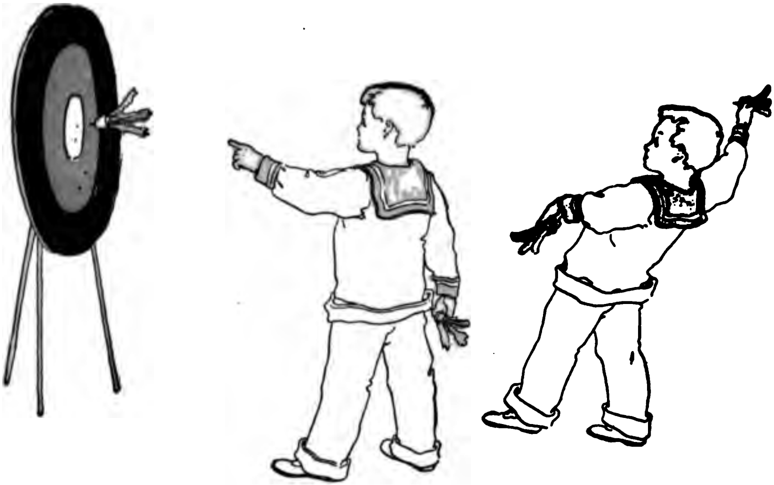
2. The sign — is used for the word "less."

3. 7 — 2 = ——
10 — 2 = ——
8 — 2 = ——
4 — 2 = ——
5 — 2 = ——
3 — 2 = ——
6 — 2 = ——
9 — 2 = ——

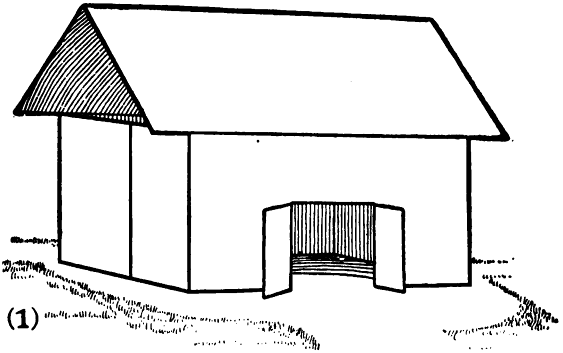
4. 9 — —— = 7
10 — —— = 8
6 — —— = 4
8 — —— = 6
7 — —— = 5
5 — —— = 3
4 — —— = 2
3 — —— = 1



5. Take 2 from each number around the circle.

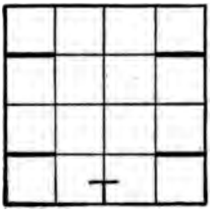


1. These boys are playing a target game. To make a target, draw a circle on a board. Within this circle draw two smaller ones. Color the spaces black, green, and white.
2. To make the dart, put a sharp wire nail through a cork. Stick three feathers in the cork.
3. Make a mark on the floor eight feet from the target. The player must stand on the mark and throw at the target.
4. If the dart hits on the white circle, 5 counts are given. If it hits on the green circle, 2 counts are given and on the black circle, 1.


(1)

MAKING A BARN FOR THANKSGIVING DAY

1. Cut an eight inch square.
2. Fold as you did for the box on page 28.
3. Cut along the heavy side lines, picture (2).
4. Fold the edge of the two middle squares on one side to the first crease.
   Cut on the crease thus formed.
5. Fold and cut the other side in the same way.
6. Cut doors as shown by heavy lines at bottom of picture (2).
7. Fold and paste as for the house on page 29. The barn now looks like picture (1).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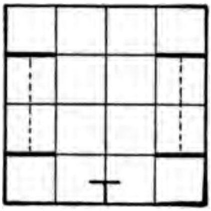
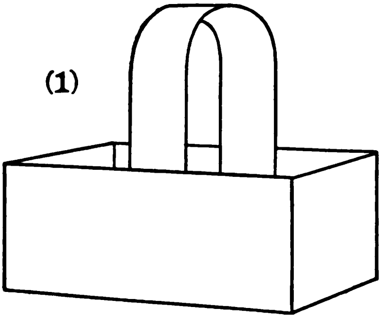
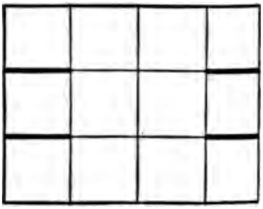

(3)

(1)





(2)

MAKING A BASKET

1. Cut an eight inch square and fold it as you did for the box.
2. Cut off one row of squares and save the strip for a handle.
3. Then cut along the heavy lines shown in picture (2).
4. Fold into shape and paste as you did for the box.
5. How long and how wide is the strip for the handle?
6. Double the strip lengthwise and paste it so that it will be strong.
7. Paste the handle to the inside of the basket as shown in picture (1). The crease will show you the middle of the basket.
8. How long is the basket? How wide is it?

1. Lay 3 toy cents in a row. Put 2 more cents in the row. Count all. How many cents?

   3 cents and 2 cents are —— cents.
   2 cents and 3 cents are —— cents.
   3 and 2 are ——
   2 and 3 are ——

2. Lay 2 rows of 3 cents each. Count all. How many cents?

   3 cents and 3 cents are —— cents.
   2 threes are ——

3. Lay a row of 3 cents and another row of 4 cents. How many in all?

   3 cents and 4 cents are —— cents.
   4 cents and 3 cents are —— cents.
   3 and 4 are ——

4. Lay a row of 3 cents and a row of 5 cents. How many in all?

   3 cents and 5 cents are —— cents.
   5 cents and 3 cents are —— cents.

5. Lay a row of 3 cents and a row of 6 cents. How many in all?

   3 cents and 6 cents are —— cents.
   6 cents and 3 cents are —— cents.

6. Lay a row of 3 cents and a row of 7 cents. How many in all?

   3 cents and 7 cents are —— cents.
   7 cents and 3 cents are —— cents.

1. Make a row of 3 cubes. Add more cubes until 10 cubes are in the row. How many did you add?

   3 cubes + —— cubes = 10 cubes.

   7 cubes + —— cubes = 10 cubes.

2. Take away 7 cubes from the row of 10 cubes. How many cubes are left?

   10 cubes — —— cubes = 3 cubes.

   10 cubes — —— cubes = 7 cubes.

3. Build a post of 3 cubes. Add more cubes until there are 9 cubes. How many cubes did you add?

   3 cubes + —— cubes = 9 cubes.

   6 cubes + —— cubes = 9 cubes.

4. Take 6 cubes off the post. How many are left?

   9 cubes — —— cubes = 6 cubes.

   9 cubes — —— cubes = 3 cubes.

5. Make a row of 3 cubes. Add enough cubes to make 6 cubes. How many cubes did you add? Take away 3 cubes. What is left?

   3 cubes + —— cubes = 6 cubes.

   6 cubes — —— cubes = 3 cubes.

6. Make a row of 3 cubes. Add enough cubes to make 8 cubes. How many did you add?

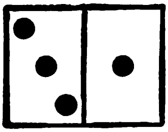
   3 cubes + —— cubes = 8 cubes.

   5 cubes + —— cubes = 8 cubes.

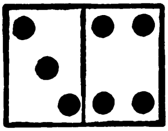
7. Take away 3 cubes from a row of 5 cubes.

   5 cubes — —— cubes = 3 cubes.

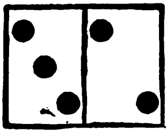
   5 cubes — —— cubes = 2 cubes.



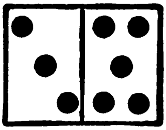
3 and 1 are ——
1 and 3 are ——
4 less 3 is ——
4 less 1 is ——



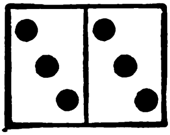
3 and 4 are ——
4 and 3 are ——
7 less 3 is ——
7 less 4 is ——



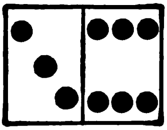
2 and 3 are ——
3 and 2 are ——
5 less 3 is ——
5 less 2 is ——



3 and 5 are ——
5 and 3 are ——
8 less 3 is ——
8 less 5 is ——

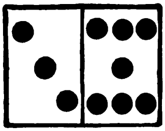


3 and 3 are ——
2 threes are ——
6 less 3 is ——



3 and 6 are ——
6 and 3 are ——
9 less 3 is ——
9 less 6 is ——

3 and 7 are ——
7 and 3 are ——



10 less 7 is ——
10 less 3 is ——

1. John made dolls from candles, pipes, clothespins, nuts, and corncobs. He made pigs from lemons. He sold them to his playmates for toy money.
2. He charged 3 cents admission to the tent where the dolls and the pigs were on sale.
3. Frank bought a pipe doll for 7 cents. What did his admission and the doll cost?
4. Ada bought a 5 cent nut doll. The doll and her admission cost —— cents.
5. Mary bought a candle doll for 4 cents. The doll and admission cost her —— cents.
6. Lily bought a clothespin doll for 3 cents. The doll and admission cost her —— cents.
7. Tom bought a lemon pig, which cost 6 cents. His admission and the pig cost him —— cents.

1. Read the numbers in blue.

1, 2, 4, 5, 7, 8,

2. 3 + 3 = ——
3 + 5 = ——
3 + 4 = ——

3 + 7 = ——
3 + 6 = ——
3 + 2 = ——

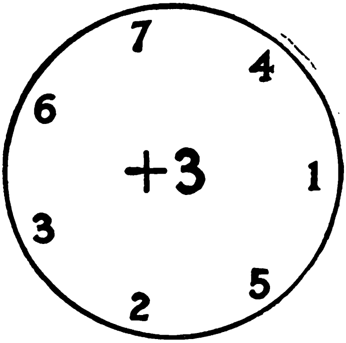
3. 3 + —— = 10
3 + —— = 6
3 + —— = 8

3 + —— = 7
3 + —— = 9
3 + —— = 5

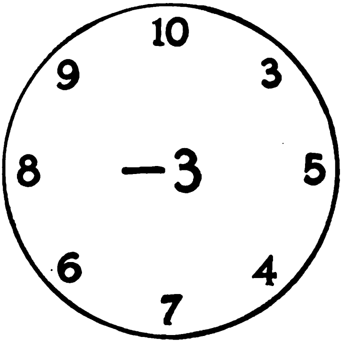
4. —— + 7 = 10
—— + 3 = 6
—— + 5 = 8

—— + 4 = 7
—— + 6 = 9
—— + 2 = 5

5.	3	3	5	3	7	8	10	6	9	7
	+ 3	+ 4	+ 3	+ 6	+ 3	— 3	— 3	— 3	— 3	— 3
	——	——	——	——	——	——	——	——	——	——



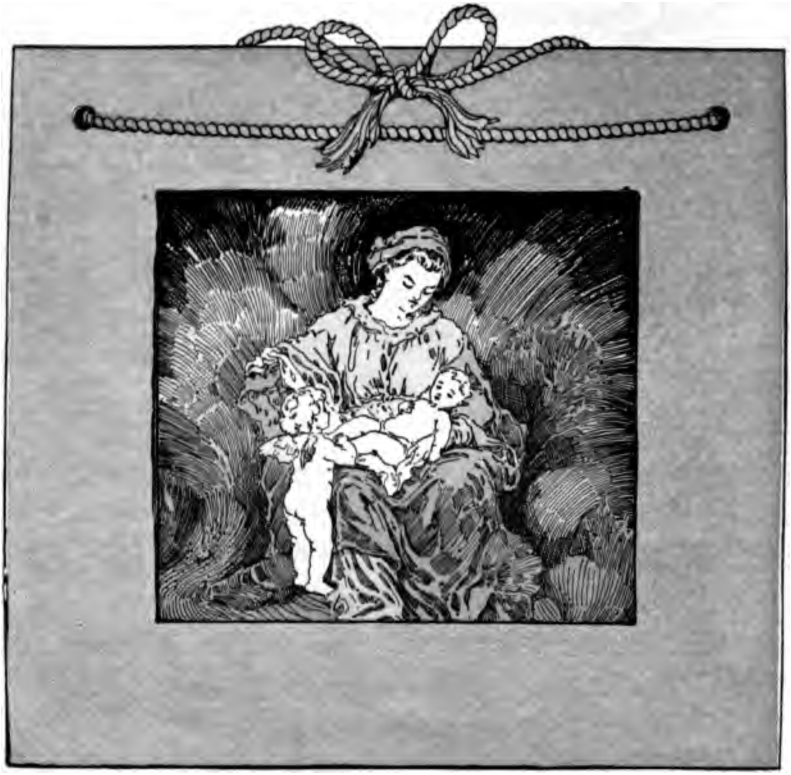
(1)



(2)

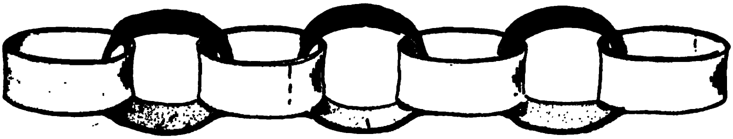
7. Put 3 with each number around circle (1).

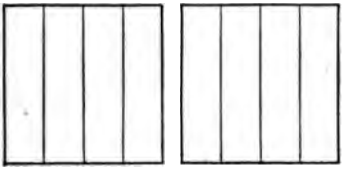
8. Take 3 from each number around circle (2).



MAKING A CHRISTMAS PICTURE

1. Cut a piece of heavy colored cardboard 6 inches long and 5 inches wide.
2. Cut off the white edges of a Christmas picture and paste it in the center of the cardboard.
3. Make two holes near the upper corners of the cardboard. Run a 12 inch cord through the holes in the picture and tie the ends together.

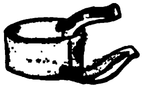




MAKING CHRISTMAS CHAINS

1. Let us make some pretty Christmas chains. Cut five 4 inch squares of red paper and five 4 inch squares of green paper.
2. Fold each square into 4 parts as in the picture. Cut along the creases. How long is each strip? How wide is each strip?
3. Paste together the ends of a red strip to make a ring.

4. Put a green strip through the red ring and paste the ends of the green strip together.



5. Put a red strip through the green ring and so on with all the strips.

A CHRISTMAS CALENDAR

1. Cut from heavy green or red cardboard 4 pieces, each 7 inches long and 3 inches wide.
2. Take apart a small calendar very carefully.
3. On one piece of the cardboard paste the three calendar leaves for the winter months.

   December
   January
   February

4. On the second piece paste the leaves for the spring months.

   March
   April
   May

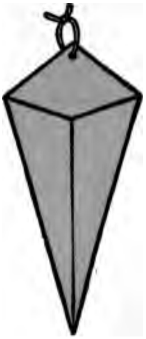
5. On the third card paste the leaves for the summer months.

   June
   July
   August

6. On the fourth card paste the leaves for the autumn months.

   September
   October
   November

7. Lay the cards on top of each other, in the right order. Make holes at the top as you did for the Christmas picture. Tie the cards with cord.



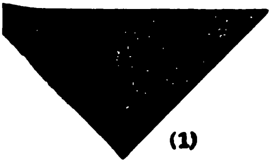
CHRISTMAS CORNUCOPIAS

Let us make a cornucopia from a 9 inch square of blue paper. Draw a line from the upper right hand corner of the square to the lower left hand corner. Cut along the line.

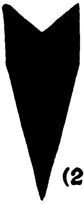
Fold together the short edges of one piece and crease. Open. Fold each short edge to the crease. Open as in (1).

Fold one side over the other as far as the crease and paste. See picture (2). Cut off the upper points. Hang by a 4 inch cord.

Let us now make another kind of cornucopia. Cut an 8 inch square of green paper. (3) Paste the lower edges together. Hang by a 4 inch cord.



(1)



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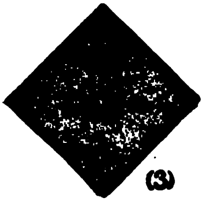

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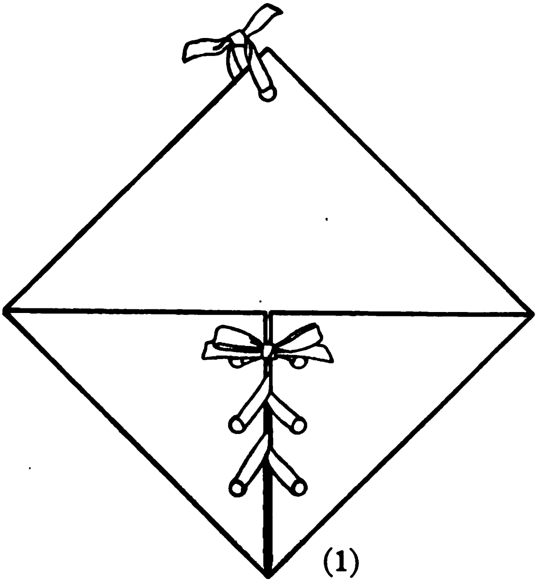
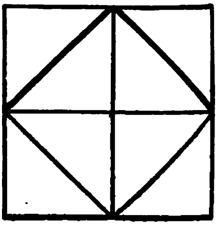


(1)



(2)

CHRISTMAS WALL POCKET

1. Here is a pretty wall pocket for holding your Christmas cards.
2. Cut an 8 inch square of colored cardboard. 4 inches from the corners place a dot on each edge.
3. Draw lines joining the dots as in (2) and cut off the upper corners along the heavy lines.
4. Fold the two lower corners so that their edges meet. Crease. See picture (1).
5. Make 6 holes in the sides and lace a 10 inch piece of ribbon through them as in (1).
6. Run a piece of ribbon through the upper point.

and 6	4 less 3	8 and 2	5 less 2	2 and 5	7 less 2

NUMBER RACE

Divide the blackboard into spaces as in the picture.

In each space write 2 numbers to be put together or taken from each other.

Divide the class into two groups.

Two children, one from each side, run a race. One child starts at the left hand space to write the answer under the numbers. At the same time the other child begins at the right hand space to write the answers. The race ends when the two children meet.

The one who has written the greater number of answers without a mistake wins that race for his side.

Erase the first set of numbers and write two new numbers in each space. The game ends when all the pupils have raced.

1. Build a post of 4 cubes. Build another post of 2 cubes. Place it on the 4 cube post. Count all the cubes. How many?

   4 cubes and 2 cubes are —— cubes.
   2 cubes and 4 cubes are —— cubes.
   6 cubes less 4 cubes are —— cubes.
   6 cubes less 2 cubes are —— cubes.

2. Build one post of 3 cubes and another of 4. Count all.

   4 cubes and 3 cubes are —— cubes.
   3 cubes and 4 cubes are —— cubes.
   7 cubes less 4 cubes are —— cubes.
   7 cubes less 3 cubes are —— cubes.

3. Build 2 posts of 4 cubes each. Count all.

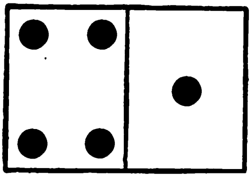
   4 cubes and 4 cubes are —— cubes.
   2 four cubes are —— cubes.
   8 cubes less 4 cubes are —— cubes.

4. Build one post of 4 cubes and one of 5. Count all.

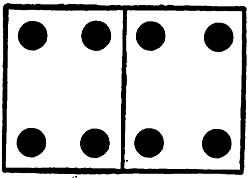
   4 cubes and 5 cubes are —— cubes.
   5 cubes and 4 cubes are —— cubes.
   9 cubes less 4 cubes are —— cubes.
   9 cubes less 5 cubes are —— cubes.

5. Build one post of 6 cubes and one of 4. Count all.

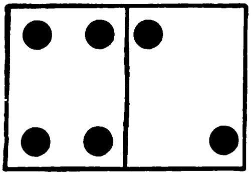
   4 cubes and 6 cubes are —— cubes.
   6 cubes and 4 cubes are —— cubes.
   10 cubes less 4 cubes are —— cubes.
   10 cubes less 6 cubes are —— cubes.



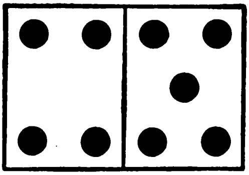
4 and 1 are ——
1 and 4 are ——
5 less 4 is ——
5 less 1 is ——



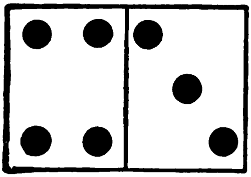
4 and 4 are ——
2 fours are ——
8 less 4 is ——



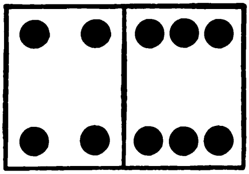
4 and 2 are ——
2 and 4 are ——
6 less 4 is ——
6 less 2 is ——



4 and 5 are ——
5 and 4 are ——
9 less 4 is ——
9 less 5 is ——



4 and 3 are ——
3 and 4 are ——
7 less 4 is ——
7 less 3 is ——



4 and 6 are ——
6 and 4 are ——
10 less 4 is ——
10 less 6 is ——

1. Cut a 5 inch strip. Mark the inches. Put with it a 2 inch strip end to end. Count all the inches.

   5 inches and 2 inches are —— inches.
   2 inches and 5 inches are —— inches.
   7 inches less 5 inches are —— inches.
   7 inches less 2 inches are —— inches.

2. Cut a 5 inch strip and a 3 inch strip. Mark the inches on both strips. Put the strips end to end. Count all the inches. How many inches?

   5 inches and 3 inches are —— inches.
   3 inches and 5 inches are —— inches.
   8 inches less 5 inches are —— inches.
   8 inches less 3 inches are —— inches.

3. Cut a 5 inch strip and a 4 inch strip. Mark all the inches and count them. How many?

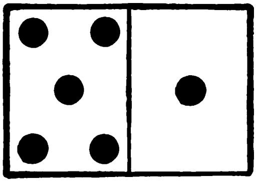
   5 inches and 4 inches are —— inches.
   4 inches and 5 inches are —— inches.
   9 inches less 5 inches are —— inches.
   9 inches less 4 inches are —— inches.

4. Put another 5 inch strip with the 5 inch strip. Mark the inches. How many inches in all?

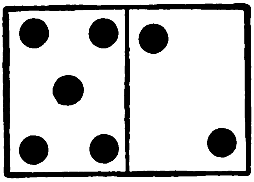
   5 inches and 5 inches are —— inches.
   2 five inches are —— inches.
   10 inches less 5 inches are —— inches.

5. Cut 5 two inch strips. Mark the inches and count them.

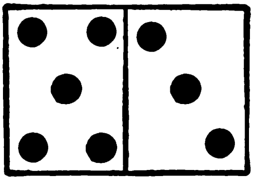
   5 two inches are —— inches.



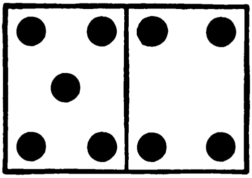
5 and 1 are ——
1 and 5 are ——
6 less 5 is ——
6 less 1 is ——



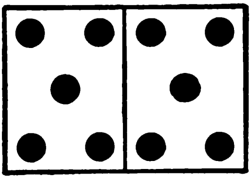
5 and 2 are ——
2 and 5 are ——
7 less 5 is ——
7 less 2 is ——



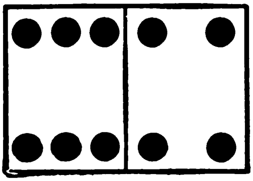
5 and 3 are ——
3 and 5 are ——
8 less 5 is ——
8 less 3 is ——



5 and 4 are ——
4 and 5 are ——
9 less 5 is ——
9 less 4 is ——



5 and 5 are ——
2 fives are ——
5 twos are ——
10 less 5 is ——



6 and 4 are ——
4 and 6 are ——
10 less 6 is ——
10 less 4 is ——

REVIEW OF ADDITION

Fill the blanks to make the numbers that stand above the lines

3

2 and ——
1 and ——

4

1 and ——
2 and ——
3 and ——

5

1 and ——
2 and ——
3 and ——
4 and ——

6

1 and ——
4 and ——
2 and ——
5 and ——
3 and ——

7

5 and ——
2 and ——
3 and ——
6 and ——
4 and ——
1 and ——

8

1 and ——
6 and ——
7 and ——
2 and ——
5 and ——
3 and ——
4 and ——

9

2 and ——
8 and ——
3 and ——
4 and ——
7 and ——
6 and ——
5 and ——
1 and ——

10

2 and ——
4 and ——
6 and ——
8 and ——
1 and ——
3 and ——
5 and ——
7 and ——
9 and ——

RACTION REVIEW WITH NUMBERS FROM 1 TO 10

1 is ——
1 is ——
2 is ——
3 is ——
2 is ——
1 is ——
1 is ——
3 is ——
2 is ——
2 is ——
3 is ——
1 is ——
4 is ——
1 is ——
5 is ——
2 is ——
4 is ——
3 is ——
1 is ——
6 is ——
2 is ——
5 is ——
3 is ——
4 is ——

8 less 1 is ——
8 less 7 is ——
8 less 2 is ——
8 less 6 is ——
8 less 3 is ——
8 less 5 is ——
8 less 4 is ——
9 less 1 is ——
9 less 8 is ——
9 less 2 is ——
9 less 7 is ——
9 less 3 is ——
9 less 6 is ——
9 less 4 is ——
9 less 5 is ——
10 less 1 is ——
10 less 9 is ——
10 less 2 is ——
10 less 8 is ——
10 less 3 is ——
10 less 7 is ——
10 less 4 is ——
10 less 6 is ——
10 less 5 is ——

1. Lay ten toy cents in a row. Place another cent near the end of the row.
2. Count all the cents? What one word means "10 and 1"?
3. Lay a row of ten cents and another row of two cents. Count the cents in both rows. How many in all?
4. What is the word for "10 and 2"?
5. Lay a row of ten cents and another of three cents. Count all the cents in both rows. How many in all?
6. Give the word that means "10 and 3."
7. Lay a row of ten cents and another of four cents. Count the cents in both rows. How many in all?
8. What word means "10 and 4"?
9. Lay ten cents and five cents. Count all the cents. How many in all?
10. What is the word for "10 and 5"?

11 ELEVEN

12 TWELVE

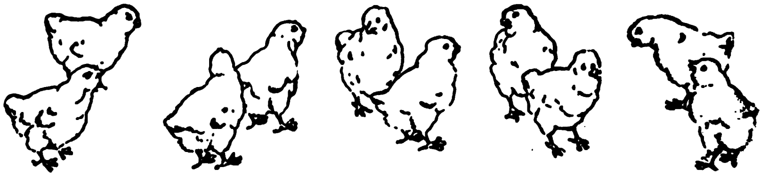
13 THIRTEEN

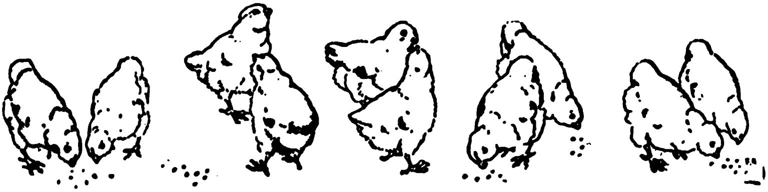
14 FOURTEEN

15 FIFTEEN

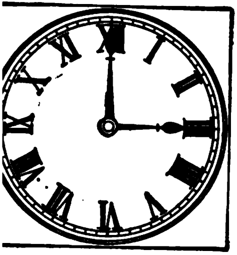
1. Make a row of 10 cents and another row of 6 cents. Count all the cents in both rows. How many in all?
2. What name is given to "10 and 6"?
3. Make a row of 10 cents and another one of 7 cents. Count all the cents in both rows. How many in all?
4. What name is given to "10 and 7"?
5. Lay 10 cents and 8 cents. Count all the cents. How many in all?
6. What name is given to "10 and 8"?
7. Lay a row of 10 cents and another of 9 cents. Count all the cents. How many?
8. What name is given to "10 and 9"?
9. Lay a row of 10 cents and another row of 10 cents. Count all the cents. How many?
10. What name is given to 2 tens?
11. Write on the blackboard all the figures from 10 to 20.
12. After each figure write its name.

16 SIXTEEN
17 SEVENTEEN
18 EIGHTEEN
19 NINETEEN
20 TWENTY





1. Count these little chickens. How many?
2. Count all the chickens by 2's. How many 2's are there?
3. Write on the board the figures to 20, writing every second figure with red chalk.
4. Read the red figures.
5. Count 20 children by 2's.
6. Beginning with 3, write on the board the figures to 18, using red chalk for every third figure.
7. Read the red figures.
8. Count 18 desks by 3's.
9. Write the figures to 19 with white chalk. Now beginning with 1, color every third figure red.
10. Read the red figures. Count by 3's.
11. Beginning with 1, count by 2's to 19.



This clock face and these books show another way of writing numbers from 1 to 12.

I for 1.
II for 2.
III for 3.
IIII or IV for 4.
V for 5.
VI for 6.
VII for 7.
VIII for 8.
IX for 9.
X for 10.
XI for 11.
XII for 12.

These are called Roman numbers.

Write each of these Roman numbers in another way:

XI, X, I, II, VII, IV, V,
III, VI, VIII, IX, XII.

Write each of these figures in Roman numbers:

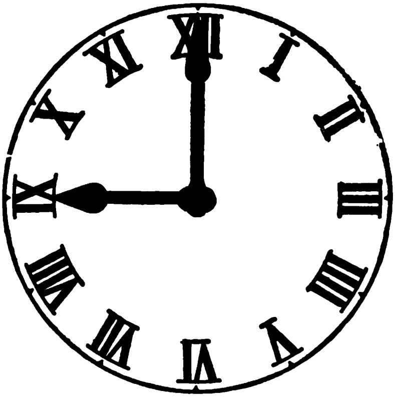
3, 6, 4, 11, 2, 7, 10,
1, 5, 8, 9, 12.

On most clock faces 4 is written IIII. On books 4 is usually written IV.

1	4	7	10
ONE	FOUR	SEVEN	TEN
I	IIII	VII	X
2	5	8	11
TWO	FIVE	EIGHT	ELEVEN
II	V	VIII	XI
3	6	9	12
THREE	SIX	NINE	TWELVE
III	VI	IX	XII

MATCHING GAME

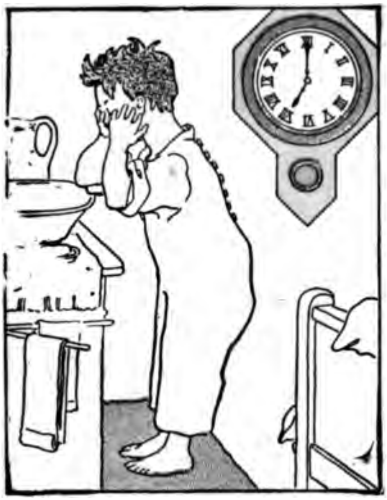
1. From pad backs or stiff paper make cards like these. Each pupil takes one card.
2. One child runs lightly to the front of the room and shows his card to the class.
3. The other children having cards with the same number written in different ways stand beside the first child and show their cards to the class.



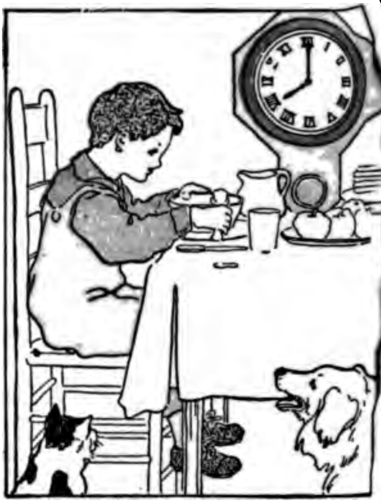
MAKING A CLOCK FACE

1. Draw a circle on cardboard. Cut around it.
2. Inside the circle mark Roman numbers from I to XII as in the picture.
3. Make two cardboard hands, one shorter than the other, and fasten them to the center of the clock face with a pin so that they can be moved.
4. The long hand is called the minute hand.
5. The short hand is called the hour hand.
6. The short hand moves from one Roman number to the next Roman number in 1 hour.
7. The long hand moves all the way around the clock face in 1 hour.
8. At the exact hour the long hand always points to XII and the short hand to the hour of the day.
9. Move the hands so as to show four o'clock.

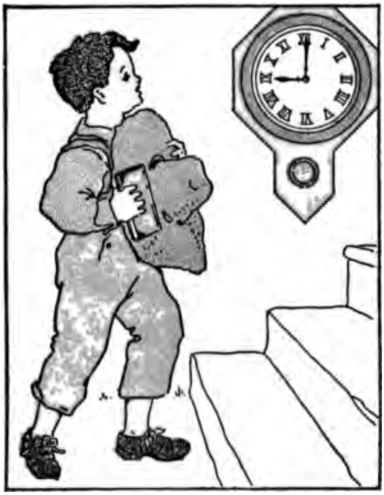
SAMUEL'S BUSY DAY



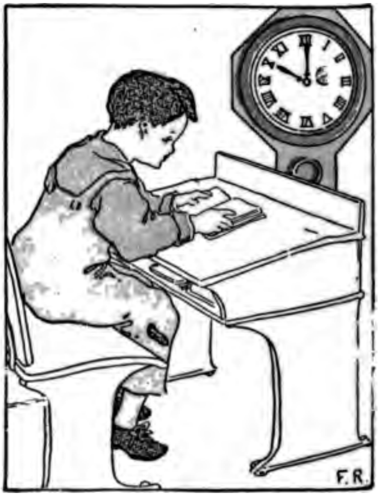
Samuel arose at —— o'clock.



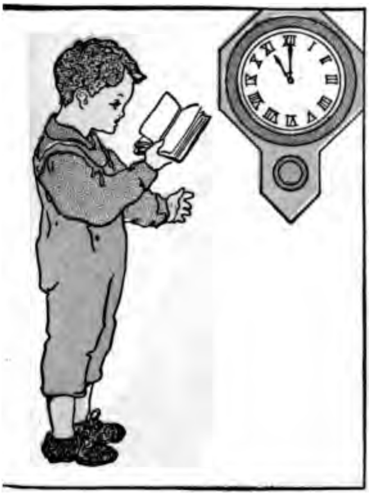
He ate breakfast at —— o'clock.



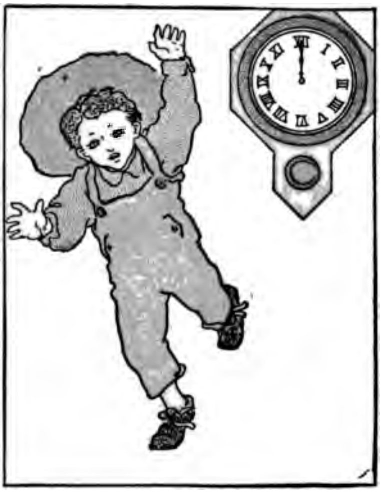
He reached school at —— o'clock.



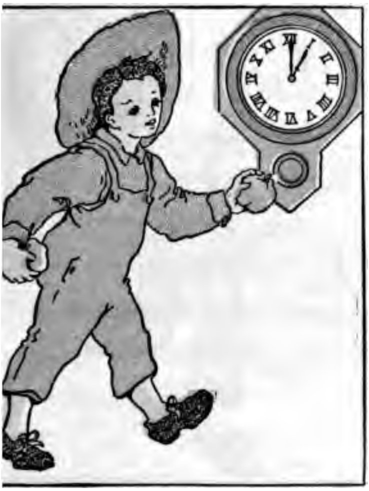
He studied his lessons at —— o'clock.



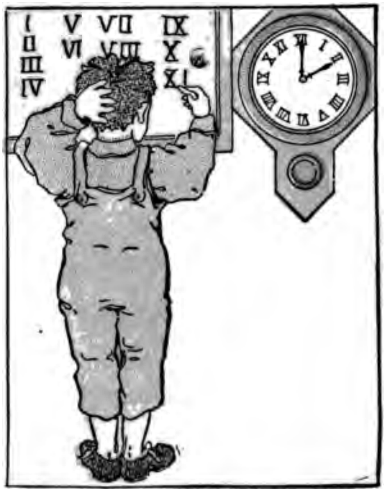
He read from his book at —— o'clock.



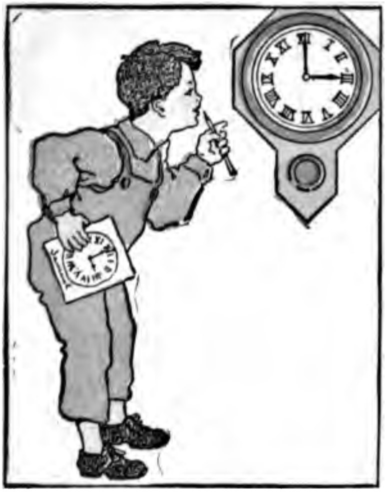
He ran home to dinner at —— o'clock.



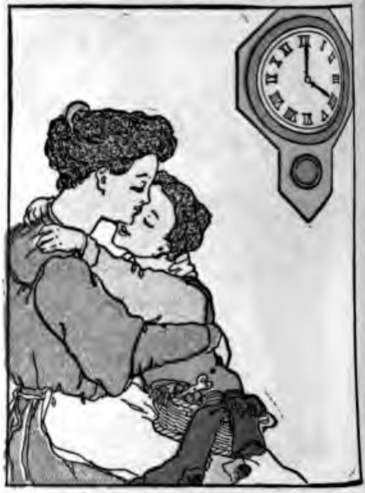
He went back to school at —— o'clock.



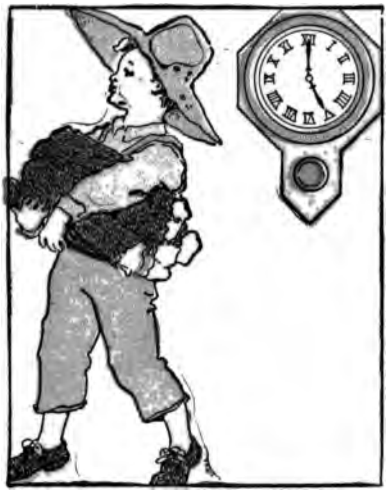
He wrote numbers at —— o'clock.



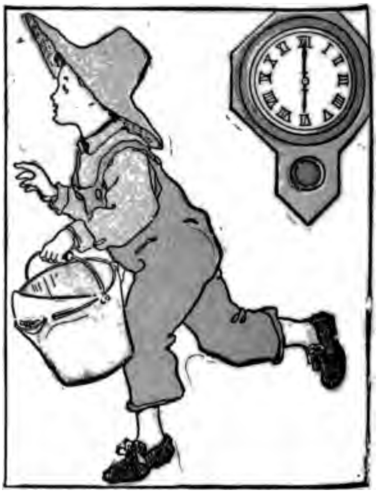
He made a clock face
at —— o'clock.



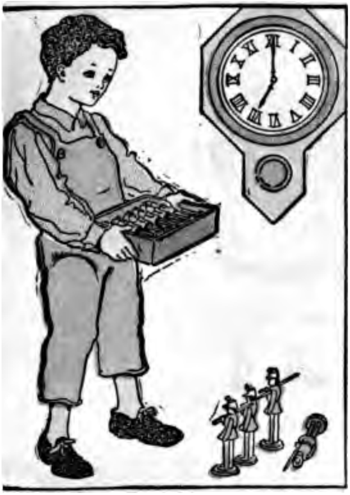
He came home at
—— o'clock.



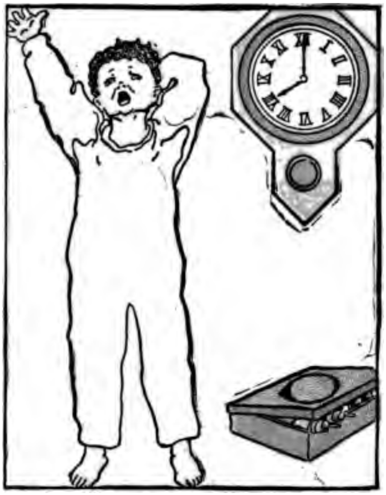
He brought in wood
at —— o'clock.



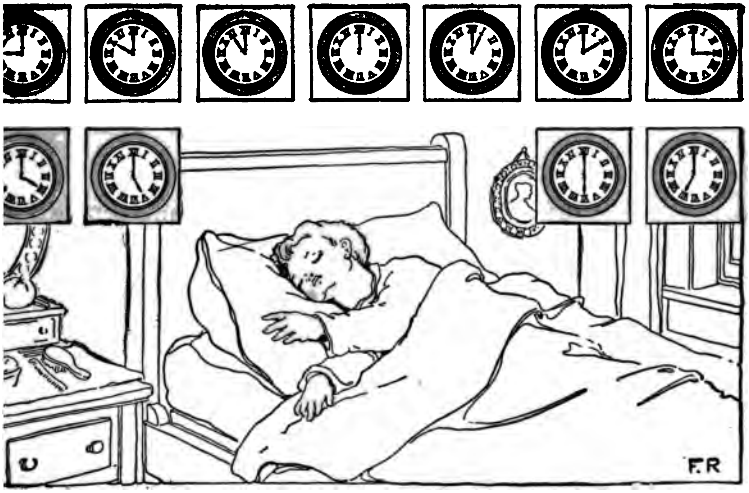
He helped to milk
at —— o'clock.



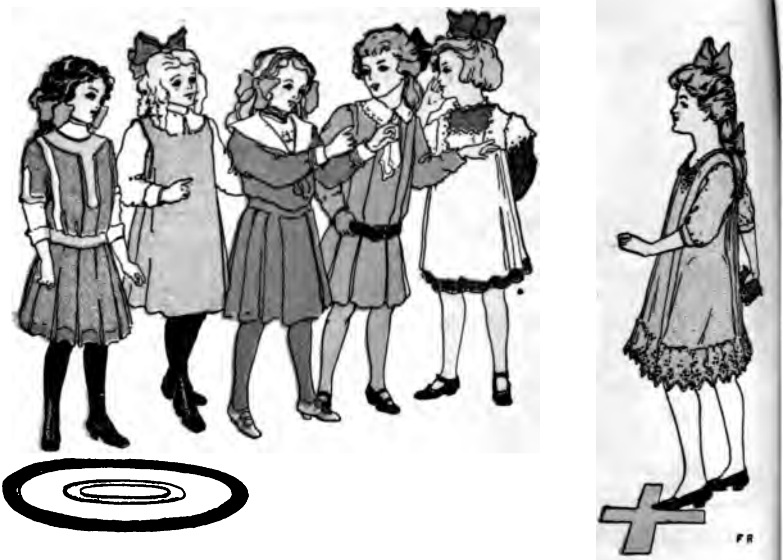
He played soldiers at
—— o'clock.



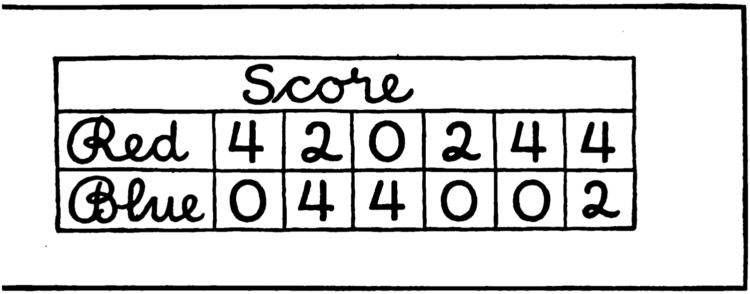
He was ready for bed
at —— o'clock.



He slept from —— o'clock until —— o'clock.
e slept through all these hours. How many hours?



1. These children are having a bean bag game. Make bean bags so that you can play. Cut a piece of cloth 12 inches long and 6 inches wide.
2. Double the cloth and sew up the edges, leaving a place to put the beans in.
3. Turn the bag so that the edges are inside, and fill it loosely with beans.
4. Sew up the opening. The bag is now finished.
5. Draw 2 circles on the floor as in the picture.
6. Make a cross on the floor to show where the thrower must stand.
7. Twelve children take turns throwing the bag. Six may pin red ribbons or papers on their shoulders and six may pin blue.



Score						
Red	4	2	0	2	4	4
Blue	0	4	4	0	0	2

KEEPING THE SCORE

Keep the score on the blackboard. Write the word RED for the children who have a red ribbon, and BLUE for those who have a blue ribbon.

After the words RED and BLUE make as many spaces on the board as there are players. See picture.

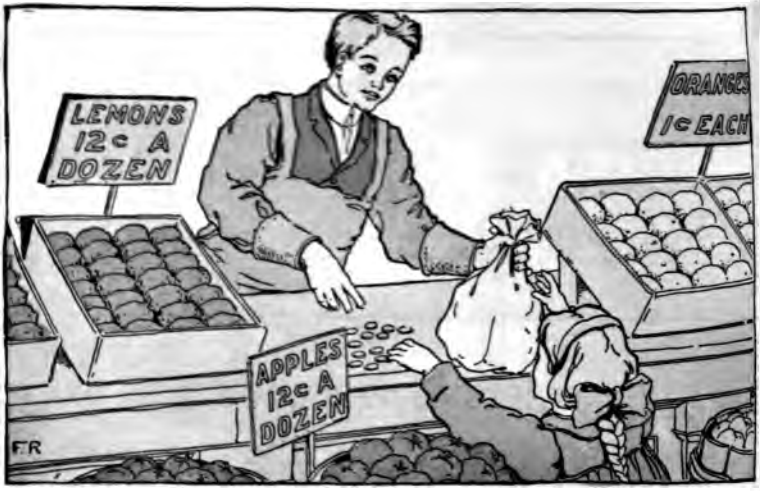
If the bag falls between the two circles, count 2. If the bag falls inside the small circle, count 4. If it falls outside the big circle, count 0.

How many counts have the REDS in the score shown in the picture?

How many counts have the BLUES in the score shown in the picture?

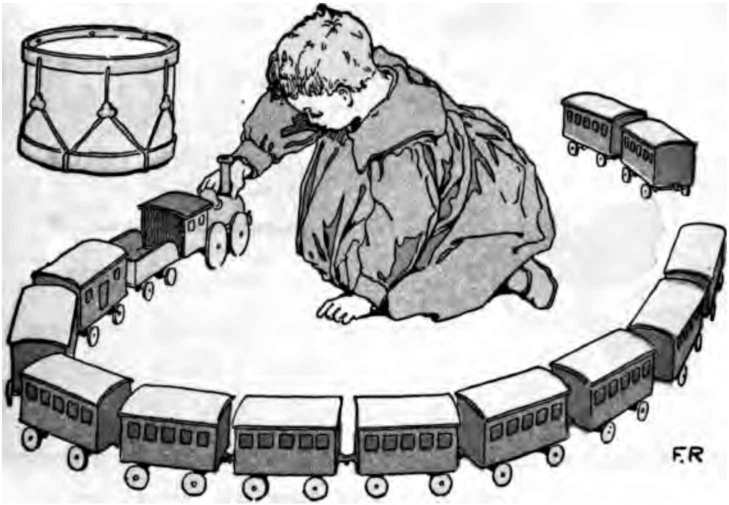
Which side won? By how many counts?

If the game had ended when three players of each side had thrown the bag, which side would have won?

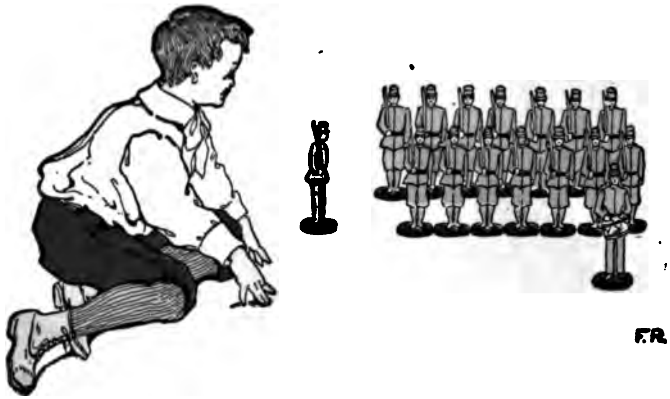


THE DOZEN

1. Twelve things are called by the name dozen.
2. Twelve lemons are one dozen lemons.
3. How many apples are one dozen apples?
4. Mary is paying the grocer 12 cents for oranges. How many oranges at 1 cent each will he give her?
5. What will she pay for one dozen lemons?
   What is the price of one lemon?
6. John has six marbles. How many more marbles does he need to make one dozen marbles?
7. May bought ten cakes. How many less than one dozen did she buy?



1. Harry has 10 cars in his train. 2 other cars are left behind. He had in all —— cars.
2. There were 11 trees in a field. 2 more were planted. How many trees were then in the field?
3. Ned had 17 cents. His father gave him 2 cents. He then had —— cents.
4. Frank gave 2 cents for a pad and 18 cents for a book. For both he paid —— cents.
5. May had 14 cents in a bank. She put in 2 more. She then had —— cents in the bank.
6. There were 13 apples on a tree and 2 more on the ground. How many apples in all?
7. Florence picked 16 red roses and 2 pink roses. She picked in all —— roses.



1. Charles has 16 tin soldiers. The drummer and the captain are not in line with the others. How many men are in the lines?
2. Dorothy wrote 13 numbers on the board. She erased 2 of them. How many were left?
3. Eleanor had 19 cents. She gave 2 cents to Helen. How many cents had she then?
4. 15 bulbs were planted in a garden. 2 of them did not come up. How many came up?
5. A line was 17 inches long. James erased 2 inches. It is now —— inches long.
6. 18 books were on the table. 2 of them were taken away. How many books were left?
7. Ned buys a pad and a rule for 14 cents. The rule costs 2 cents. The pad costs —— cents.
8. Alice had 20 cents. She spent 2 cents. How much money has she left?

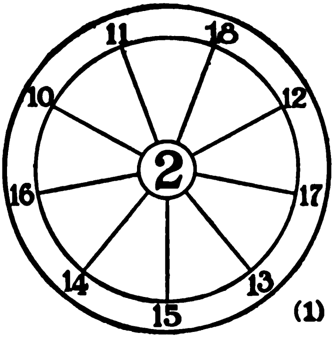
0	11	12	13	14	15	16
2	+2	+2	+2	+2	+2	+2
17	18	10	11	12	13	14
2	+2	−2	−2	−2	−2	−2
15	16	17	18	19	20	
−2	−2	−2	−2	−2	−2	

NUMBER GAME

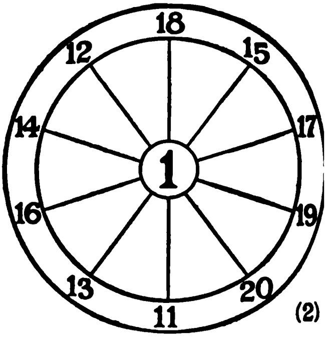
Cut 20 cards 6 inches long and 4 inches wide.
On them write the numbers shown above.
Two pupils choose sides and all stand.
Each leader takes 10 of the cards.
One leader reads the numbers on a card and names a child on the other side, who must give the right answer. If the child fails he takes his seat and others are called upon until the right answer is given.

The other leader then reads a card and names a player on the other side to answer.

The side having the greater number of pupils standing after all the cards have been read wins the game.



(1)



(2)

1. Put the number in the center of the left han circle with each number around it.
2. Take the number in the center away from eac number around the right hand circle.

3.

1	2	3	4	5	6	7	8	9
+ 1	1	1	1	1	1	1	1	1
—	—	—	—	—	—	—	—	—

4.

11	12	13	14	15	16	17	18	19
— 1	1	1	1	1	1	1	1	1
—	—	—	—	—	—	—	—	—

5.

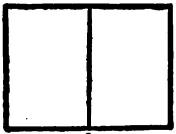
1	2	3	4	5	6	7	8	9	10
+ 2	2	2	2	2	2	2	2	2	2
—	—	—	—	—	—	—	—	—	—

6.

11	12	13	14	15	16	17	18	19	20
— 2	2	2	2	2	2	2	2	2	2
—	—	—	—	—	—	—	—	—	—

CAP FOR WASHINGTON'S BIRTHDAY

1. Cut paper 24 inches long and 18 inches wide.
2. Fold the short edges together and crease.
3. Hold with the creased edge at the top.
4. Fold the right and left edges together. Crease. Open as in picture (1).
5. Fold the upper corners to the crease as in (2).
6. Fold one piece upward on the front of the cap as in (3). Crease. Fold the other piece upward on the back of the cap. (3)
7. Fold in corner A and corner B. See (4).
8. Open the cap. Push the two lower corners together until a square is formed as in (5). Hold as in (5).
9. Fold corners at D to the top of the cap, one up over the front and the other up over the back. (6)
10. Open the cap at the bottom to fit the shape of the head. Paste on a red, white, and blue rosette.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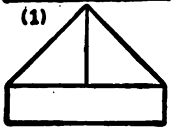
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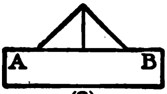

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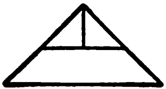
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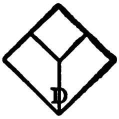

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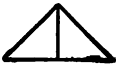

(6)

TAKING NUMBERS TWO TIMES

1. Make 2 rows of cubes with 2 cubes in each row. How many cubes in both rows?

   2 cubes + 2 cubes = —— cubes.
   2 times 2 cubes = —— cubes.
   Two 2's = ——

2. Make 2 rows of cubes with 3 cubes in each row. How many cubes in both rows?
3. Make 3 rows of cubes with 2 cubes in each row. How many cubes in all three rows?

   3 cubes + 3 cubes = —— cubes.
   2 times 3 cubes = —— cubes.
   2 cubes + 2 cubes + 2 cubes = —— cubes.
   3 times 2 cubes = —— cubes.
   Two 3's = ——   Three 2's = ——

4. Make 2 rows of cubes with 4 cubes in each row. How many cubes in both rows?
5. Make 4 rows of cubes with 2 cubes in each row. How many cubes in all 4 rows?

   2 times 4 cubes = —— cubes.
   4 times 2 cubes = —— cubes.
   Two 4's = ——   Four 2's = ——

6. Make 2 rows with 5 cubes in each row. Count all.
7. Make 5 rows with 2 cubes in each row. Count all.

   2 times 5 cubes = —— cubes.
   5 times 2 cubes = —— cubes.
   Two 5's = ——   Five 2's = ——

Make 2 rows of cubes with 6 cubes in each row. How many cubes in both rows?
Make 6 rows of cubes with 2 cubes in each row. How many cubes in all six rows?

2 times 6 cubes = —— cubes.
6 times 2 cubes = —— cubes.
Two 6's = —— Six 2's = ——

Make 2 rows with 7 cubes in each row. Count all.
Make 7 rows with 2 cubes in each row. Count all.

2 times 7 cubes = —— cubes.
7 times 2 cubes = —— cubes.
2 times 7 = —— 7 times 2 = ——

Make 2 rows with 8 cubes in each row. Count all.
Make 8 rows with 2 cubes in each row. Count all.

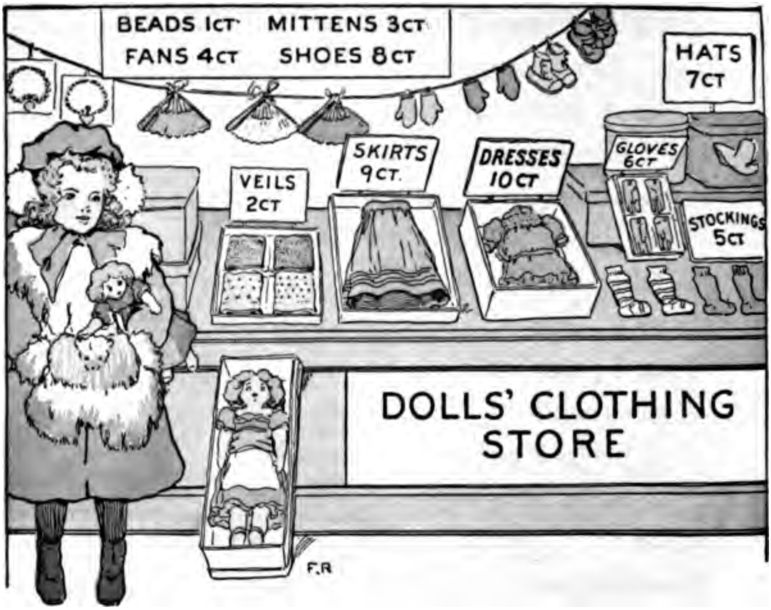
2 times 8 cubes = —— cubes.
8 times 2 cubes = —— cubes.
2 times 8 = —— 8 times 2 = ——

Make 2 rows with 9 cubes in each row. Count all.
Make 9 rows with 2 cubes in each row. Count all.

2 times 9 cubes = —— cubes.
9 times 2 cubes = —— cubes.
2 times 9 = —— 9 times 2 = ——

Make 2 rows of 10 cubes each. Count all.
Make 10 rows of 2 cubes each. Count all.

2 times 10 cubes = —— cubes.
10 times 2 cubes = —— cubes.
2 times 10 = —— 10 times 2 = ——



1. Elizabeth has gone to the store to buy some clothing for her doll. What will she pay for 2 pairs of stockings?
2. 2 skirts will cost —— cents.
3. 2 veils will cost —— cents.
4. 2 pairs of gloves will cost —— cents.
5. 2 pairs of shoes will cost —— cents.
6. 2 pairs of mittens will cost —— cents.
7. 2 strings of beads will cost —— cents.
8. 2 fans will cost —— cents.
9. 2 dresses will cost —— cents.
10. 2 hats will cost —— cents.

TAKING NUMBERS TWO TIMES

1. 2 twos are —— 2 times 2 = ——

2. 2 threes are —— 2 times 3 = ——

3 twos are —— 3 times 2 = ——

3. 2 fours are —— 2 times 4 = ——

4 twos are —— 4 times 2 = ——

4. 2 fives are —— 2 times 5 = ——

5 twos are —— 5 times 2 = ——

5. 2 sixes are —— 2 times 6 = ——

6 twos are —— 6 times 2 = ——

6. 2 sevens are —— 2 times 7 = ——

7 twos are —— 7 times 2 = ——

7. 2 eights are —— 2 times 8 = ——

8 twos are —— 8 times 2 = ——

8. 2 nines are —— 2 times 9 = ——

9 twos are —— 9 times 2 = ——

9. 2 tens are —— 2 times 10 = ——

10 twos are —— 10 times 2 = ——

10. 2 × 10 = 20.

The sign $\boxed{\times}$ is often used instead of the word "times."

11. 1 × 2 = ——

2 × 2 = ——

3 × 2 = ——

4 × 2 = ——

5 × 2 = ——

6 × 2 = ——

7 × 2 = ——

8 × 2 = ——

9 × 2 = ——

10 × 2 = ——

2×1	2×2	2×3	2×4	2×5

FRONT

1×2	2×2	3×2	4×2	5×2

BACK

2×6	2×7	2×8	2×9	2×10

FRONT

6×2	7×2	8×2	9×2	10×2

BACK

2	4	6	8	10
12	14	16	18	20

CARDS FOR NUMBER GAME

Cut 20 cards 8 inches long and 4 inches wide. On them write the numbers as shown on the opposite page. Write “2 × 1” on one side of a card and “1 × 2 on the other side of the same card.

Each pupil in the class takes one card.

One child runs lightly to the front of the room and shows his card to the class, as “2 × 6”. The pupil who has the card with “12” on it, runs lightly forward and stands beside the first pupil.

If the first child shows a card with only 1 number on it, as “16”, the child who has the card with “2 × 8” on it, runs forward and shows the card to the class.

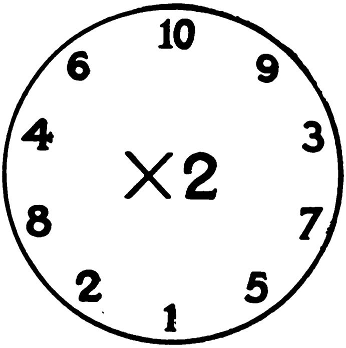
Pupils in their seats watch for mistakes.

1.
$$\begin{array}{rrrrrrrrrrr} & 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 \\ \times & 2 & 2 & 2 & 2 & 2 & 2 & 2 & 2 & 2 & 2 \\ \hline \end{array}$$

2.
$$\begin{array}{rrrrrrrrrrr} & 2 & 2 & 2 & 2 & 2 & 2 & 2 & 2 & 2 & 2 \\ \times & 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 \\ \hline \end{array}$$

3. 2 × —— = 20
2 × —— = 6
2 × —— = 10
2 × —— = 18
2 × —— = 14
2 × —— = 8
2 × —— = 2
2 × —— = 16
2 × —— = 4
2 × —— = 12

4. —— × 2 = 20
—— × 2 = 12
—— × 2 = 10
—— × 2 = 8
—— × 2 = 4
—— × 2 = 2
—— × 2 = 6
—— × 2 = 18
—— × 2 = 14
—— × 2 = 16



◣**5.** What is 2 times each number around the circle?

MAKING A MAY BASKET

Cut a 12 inch square of heavy paper.

Fold the square in 4 rows of 4 squares each as in picture (1).

How many small squares are there?

How large is each small square?

Cut off one row of squares.

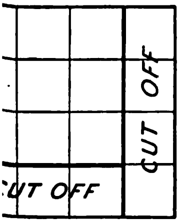
How many squares did you cut off? How many squares remain?

Cut off a row of 3 squares. Save it for a handle.

Cut along the heavy lines shown in picture (2).

Fold in shape and paste the corner squares over the middle squares so that they will meet as in picture (3).

Fold the short strip that you cut off, lengthwise to make a strong handle. Paste it to the basket as in picture (3).



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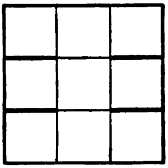

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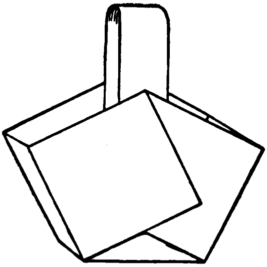

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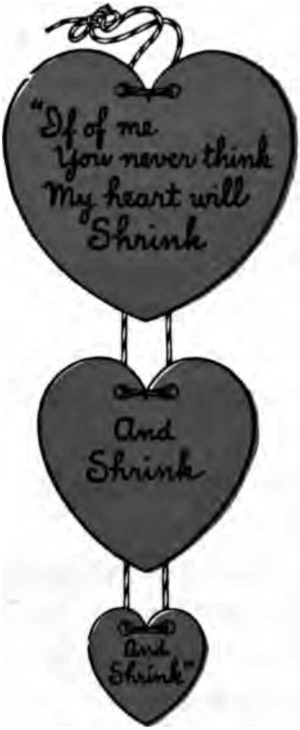

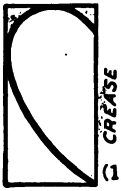

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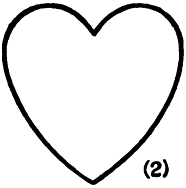
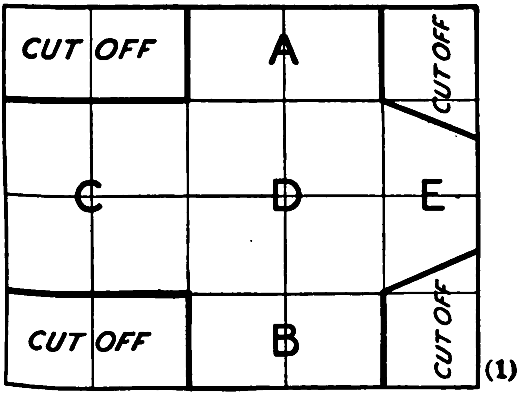
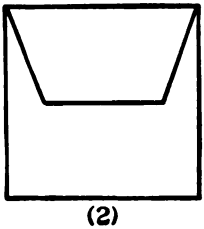


(2)

1. Cut from red cardboard a 3 inch square, a 2 inch square, and a 1 inch square.
2. Cut from white paper a 3 inch square. Double it and crease. Starting from the crease draw one side of a heart. (1) Cut around the heavy line and open. Put the heart on the red 3 inch square and draw around it. Cut out as in (2).
3. Cut smaller red hearts in the same way.
4. String the hearts together. Write the words on them as in the picture.



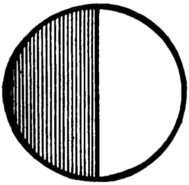


MAKING AN ENVELOPE FOR THE VALENTINE

1. Cut a piece of paper 10 inches long and 8 inches wide.
2. Along each edge mark off the 2 inches by placing dots.
3. Draw lines joining the opposite dots as in picture (1).
4. Cut off the corners along the heavy lines shown in picture (1).
5. Fold A and B over D. Fold C and paste to A and B.
6 Fold the flap E and crease as in (2).

PINT AND QUART

1. These children are measuring water. They have measures of two sizes.
2. The small measure is called the pint measure.
3. The larger measure is called the quart measure.
4. Fill a pint measure with water. Pour the water into a quart measure. Repeat until the quart measure is full.
5. How many pints make a quart?
6. Pour the water from the quart measure into pint measure. How many pints will 1 quart make?
7. 1 pint of milk is one half of 1 quart of milk.
8. 1 —— of water is one half of 1 quart of water.



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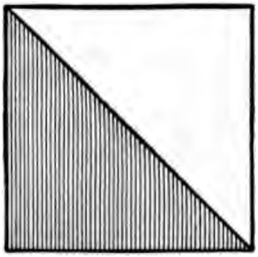

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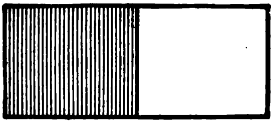

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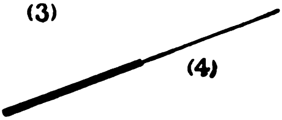
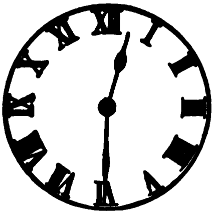


(4)

1. What part of the circle is shaded? What part is white? (1)
2. What part of the square is shaded? What part is white? (2)
3. What part of the oblong is shaded? What part is white? (3)
4. What part of the line is heavy? What part is light? (4)
5. Draw a 4 inch square. Shade one half of it.
6. Draw a 6 inch square. Shade one half of it.
7. Draw a 7 inch square. Shade one half of it.
8. Draw an oblong 10 inches long and 4 inches wide. Shade one half of it.
9. Draw a 16 inch line. Color one half of it.
10. Draw an oblong 12 inches long and 3 inches wide. Shade one half of it.
11. Draw an 18 inch line. Color one half of it.
12. Draw a 20 inch line. Color one half of it.



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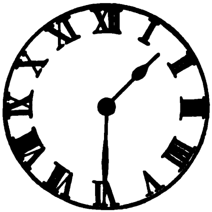

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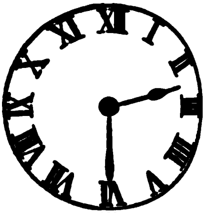

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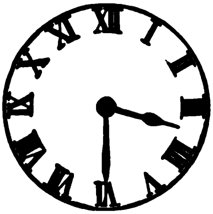

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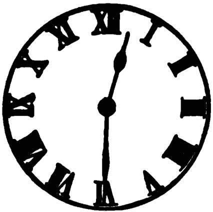

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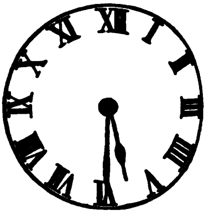

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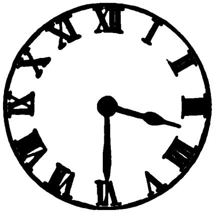

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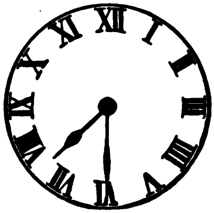

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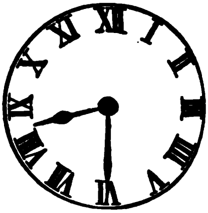

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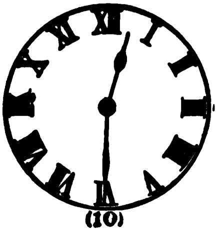

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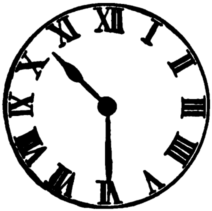

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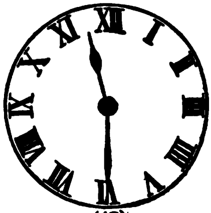


(12)

READING THE CLOCK

1. What time is it by each of these clocks?
2. Where does the hour hand point?
3. Where does the minute hand point?

1. Cut a 6 inch strip of paper. Fold into 2 equal parts. Each part is one half of —— inches.

   One half of 6 inches is —— inches.

2. Cut a strip 4 inches long. Fold in halves. Measure each half.

   One half of 4 inches is —— inches.

3. Cut an 8 inch strip. Fold in halves. Measure each half.

   One half of 8 inches is —— inches.

4. Cut an 18 inch strip. Fold in halves. Measure each.

   One half of 18 inches is —— inches.

5. Cut a 14 inch strip. Fold in 2 equal parts. Measure each.

   One half of 14 inches is —— inches.

6. Cut a 16 inch strip. Fold in 2 equal parts. Measure each.

   One half of 16 inches is —— inches.

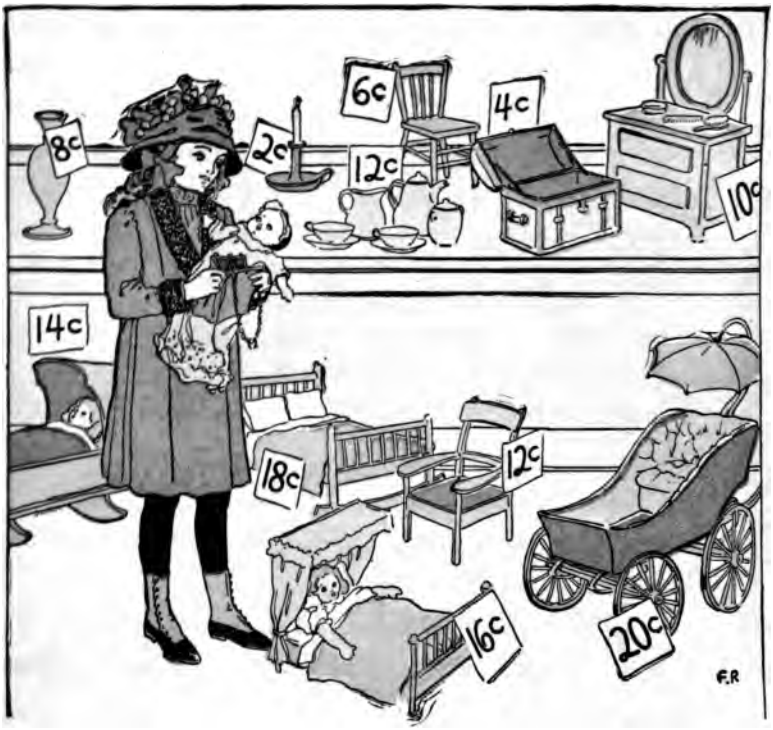
7. Cut a 10 inch strip. Fold in halves. Measure each half.

   One half of 10 inches is —— inches.

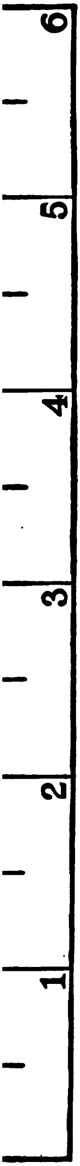
8. Cut a 20 inch strip. Fold in halves. Measure each.

   One half of 20 inches is —— inches.

9. Cut a foot strip. Fold in halves. How many inches are there in one half of a foot?
   One half of 12 inches is —— inches.

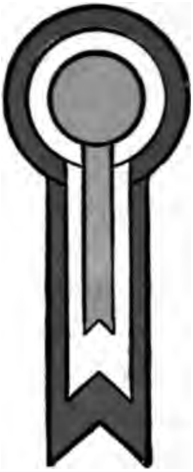


1. Today Helen can buy furniture for her doll's house at one half of the marked prices. The trunk will cost her —— cents.
2. For the dishes she will give —— cents.
3. What will she give for the bed marked 18c?
4. What will the carriage cost her? The vase?
5. What can she buy for 8 cents? For 3 cents?
6. What can she buy for 1 cent? For 5 cents?
7. What can she buy for 7 cents? For 6 cents?



1. Here is a picture of a six inch rule. Into how many parts is each inch divided?
2. Cut a piece of paper 1 inch long. Fold it into 2 equal parts. Each part is one —— inch long.
3. Count the half inches on the six inch rule. How many?
4. Count the half inches in 3 inches. How many half inches?
5. Count the half inches in 5 inches. How many half inches?
6. Count the half inches in 4 inches. How many half inches?
7. Count the half inches in 2 inches. How many half inches?
8. Draw a line one and one half inches long.
9. Draw a line two and one half inches long.
10. Draw a line 3 and one half inches long.
11. Draw a line 4 and one half inches long.
12. Draw a line 5 and one half inches long.
13. One half may be written $\frac{1}{2}$

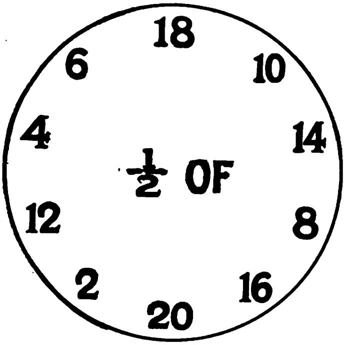
ONE HALF $\frac{1}{2}$ 1 HALF



BADGE FOR MEMORIAL DAY

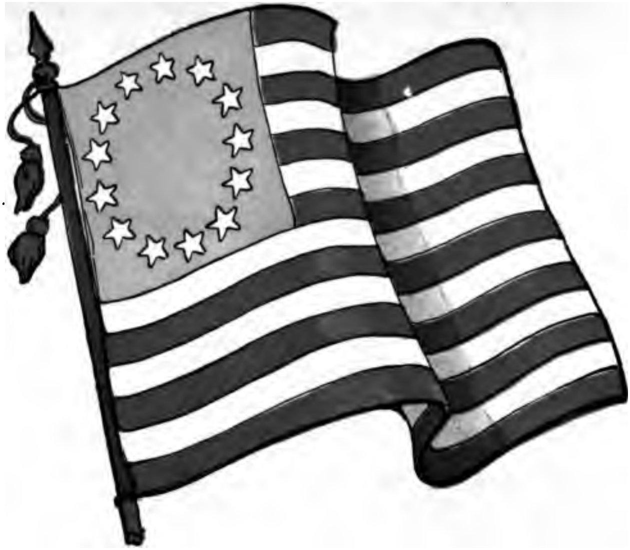
1. Draw a three inch circle on red paper, a two inch circle on white paper, and a one inch circle on blue paper. Cut out the three circles.
2. Cut a strip of red paper six inches long and one and one half inches wide.
3. Cut a strip of white paper five inches long and one inch wide.
4. Cut a strip of blue paper four inches long and one half inch wide.
5. Cut one end of each strip as shown in the picture.
6. Paste the strips and the circles over each other as shown in the picture.

1. Draw a line one half of a foot long. Below the line write the number of inches in it.
2. Draw a line one half of 10 inches long. Write its length.
3. Draw a line one half of 8 inches long. Write its length.
4. Draw a line ½ of 16 inches long. How long is it?
5. Draw a line ½ of 14 inches long. How long is it?
6. Draw a line ½ of 18 inches long. How long is it?
7. Draw a line ½ of 20 inches long. How long it is?
8. What is ½ of each number around the circle?



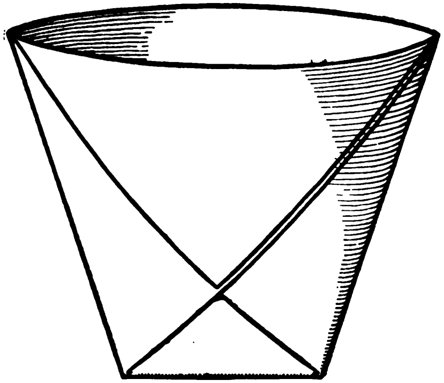
9. Copy this table and write the answers.

½ of 2 = ——
½ of 4 = ——
½ of 6 = ——
½ of 8 = ——
½ of 10 = ——
½ of 12 = ——
½ of 14 = ——
½ of 16 = ——
½ of 18 = ——
½ of 20 = ——



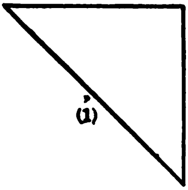
FLAG DAY

1. This is a picture of our first flag. Count the red stripes. How many? How many white stripes?
2. Count the stars. How many?
3. Count all the stripes on your school flag. How many? Is the number the same as on this flag?
4. Which flag has more stars?
5. Cut a piece of white paper 10 inches long and 6½ inches wide. Mark half inches on the short edges.
6. Cut 7 strips of red paper, 10 inches long and ½ inch wide. Paste them on the white paper one half inch apart.
7. Cut a 3½ inch square of blue paper. Paste it in the upper left hand corner. Mark stars with chalk.



MAKING A DRINKING CUP

1. Cut an 8½ inch square of white paper.
2. Fold as shown in picture (1).
3. Turn as in picture (2). 3½ inches from the square corner make a dot on each edge as in (2).
4. Fold the right hand corner to the dot on the left hand side of the paper. (3)
5. Fold the left corner to the right hand dot. (4)
6. Separate and fold down the upper points as in the picture at the top of the page.
7. How wide is the top of the cup? The bottom?
8. How high is the cup?
9. How many cups has your class made?



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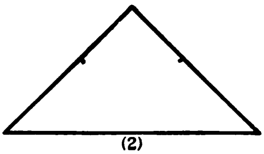

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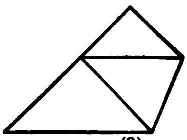

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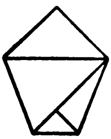

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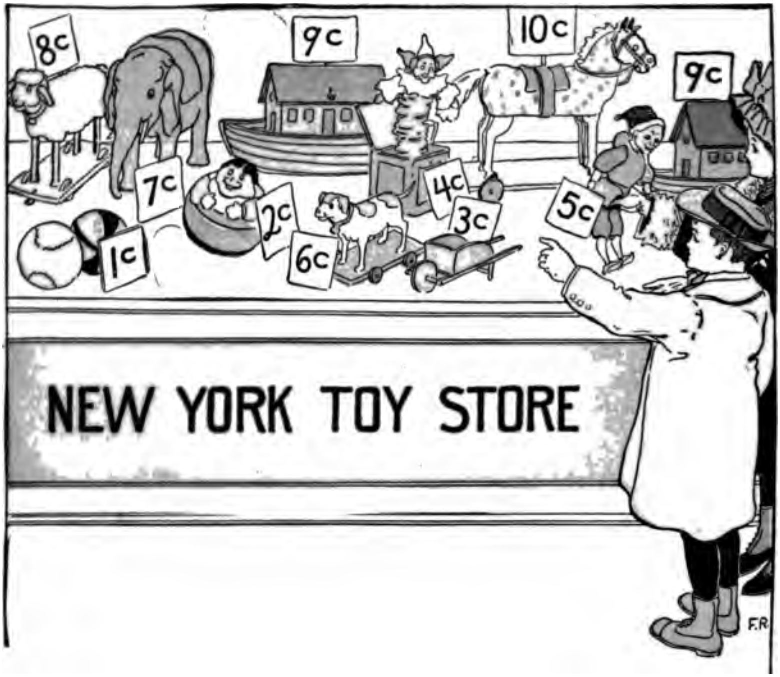
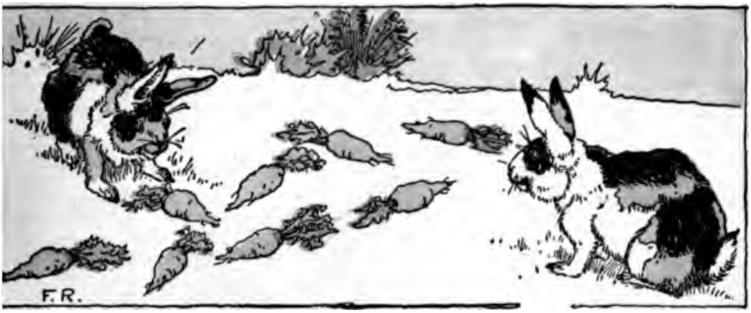


1. Mother gave Edith and John money to buy toys. How many horses can they buy for 20 cents?
2. How many Noah's Arks will 18 cents buy?
3. How many balls can they buy for 2 cents?
4. How many elephants can they buy for 14 cents?
5. How many dogs can they buy for 12 cents?
6. 8 cents will pay for two ——
7. 4 cents will pay for two ——
8. 10 cents will pay for two ——
9. 16 cents will pay for two ——
10. Two wheel barrows will cost —— cents.



Divide the carrots in the picture into 2 parts so that each rabbit may have the same number. How many carrots will each rabbit get?

8 carrots divided by 2 = —— carrots.

Instead of the words "divided by" the sign ÷ is often used.

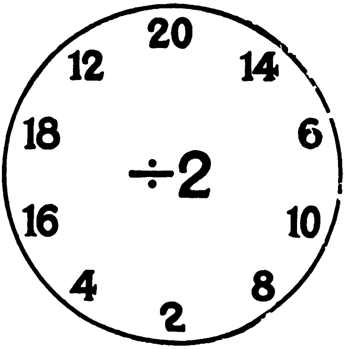
Using the sign ÷, copy these numbers:

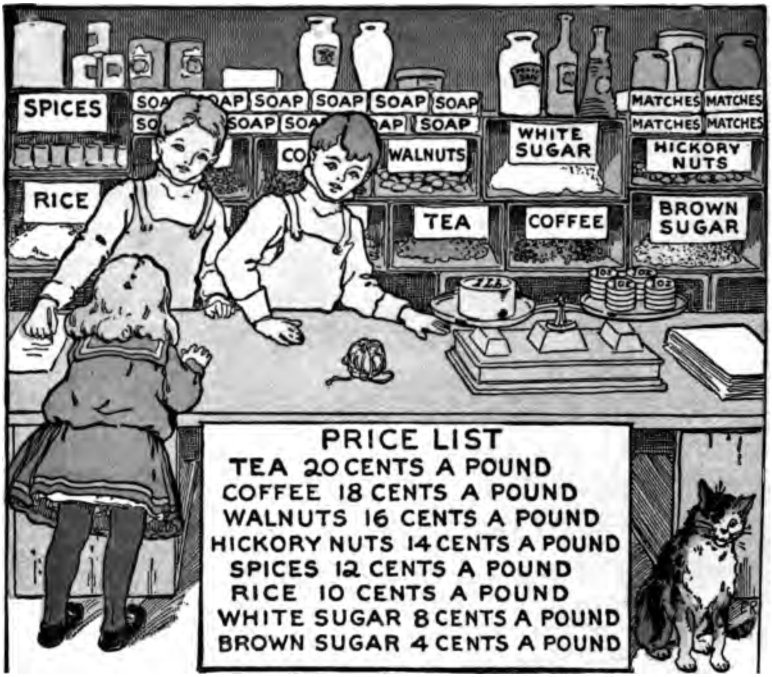
6 divided by 2 = 3
8 divided by 2 = 4
10 divided by 2 = 5
12 divided by 2 = 6
14 divided by 2 = 7

16 divided by 2 = 8
18 divided by 2 = 9
20 divided by 2 = 10

Dividing a number into 2 equal parts is finding what part of the number?

Divide the numbers around the circle by 2.





1. Harold and Edward had a pair of scales for a present and Harold said, "Let us play store."
2. They used empty boxes for shelves. They put cans, bottles, and paper boxes on the shelves.
3. Edward brought dirt for brown sugar and Harold had some sand for white sugar.
4. Acorns were used for hickory nuts and horse chestnuts for walnuts.
5. The small seeds of a weed were called coffee and the leaves of a weed were called tea.
6. *Leaves* were used for spices and gravel for rice.

Harold placed a large weight marked "1 Lb." (Pound) on one side of the scales and Edward placed small weights marked "1 Oz." (Ounce) on the other side until they balanced.

How many ounce weights did he put on the scales to balance the pound weight?

In one pound there are —— ounces.

How many ounces make a half pound?

How much did the boys charge for one pound of coffee?

What did they charge for one half of a pound of coffee?

What did they charge for a half pound of tea?

What did they charge for eight ounces of walnuts?

Four ounces of walnuts will sell for how many cents?

8 ounces of hickory nuts will cost —— cents.

8 ounces of rice will sell for —— cents.

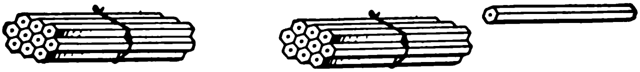
A half pound of spices will cost —— cents.

1½ pounds of brown sugar at 4 cents a pound will cost how many cents?

1½ pounds of white sugar at 8 cents a pound will cost how many cents?

How many ounces must you put with an 8 ounce package to balance a 12 ounce package?

1. Count the pencils in one bundle. How many?

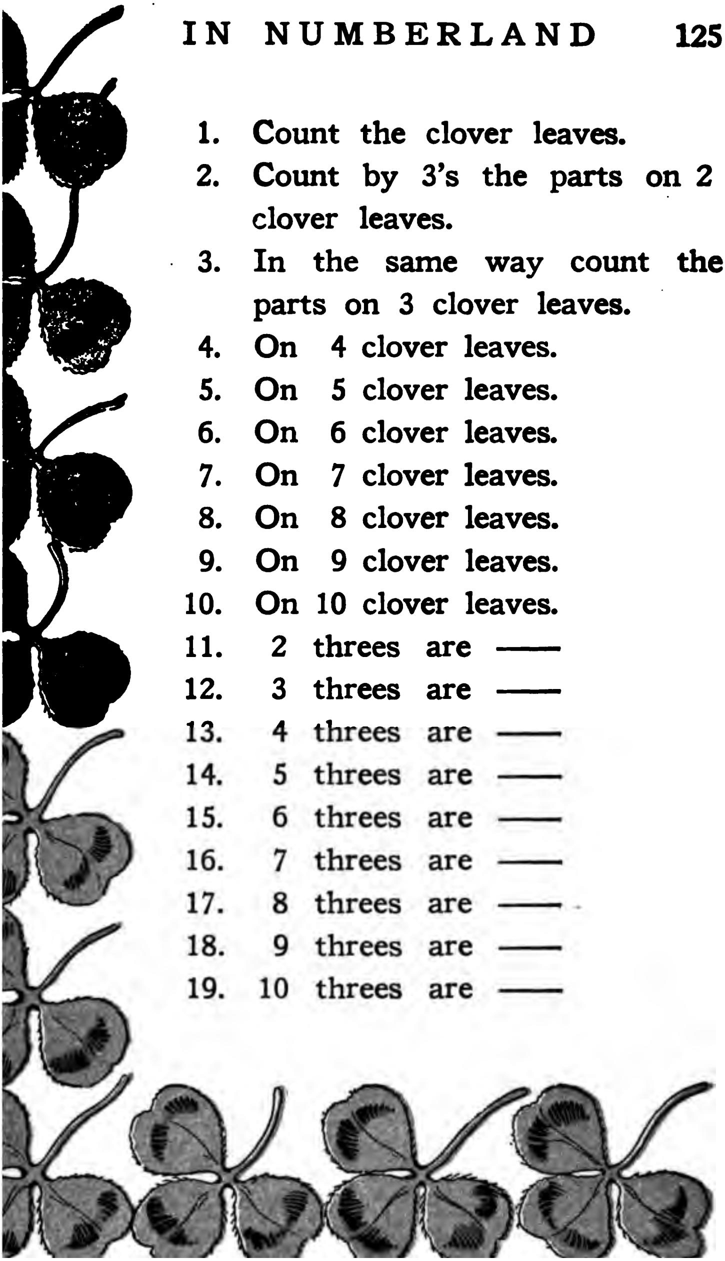


2. Count the pencils in both bundles. How many?
3. How many pencils are not in the bundles? How many pencils are there in all?
4. Two tens and one are called "twenty-one."
5. We write twenty-one also in this way: 21.
6. Two bundles of ten pencils each, and two pencils are twenty-—— pencils.
7. We write twenty-two also in this way: 22.
8. Read these numbers: twenty-three, twenty-four, twenty-five, twenty-six, twenty-seven, twenty-eight, twenty-nine.
9. Write these names and after each write the number in figures:

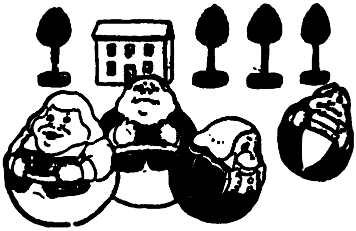
    twenty
    twenty-one
    twenty-two
    twenty-three
    twenty-four
    twenty-five
    twenty-six
    twenty-seven
    twenty-eight
    twenty-nine

10. Read these numbers: 28, 25, 29, 23, 26, 20, 27, 22, 24, 21.

11. We call 3 tens by the name "thirty."
12. We write 3 tens also in this way: 30.



1. Count the clover leaves.
2. Count by 3's the parts on 2 clover leaves.
3. In the same way count the parts on 3 clover leaves.
4. On 4 clover leaves.
5. On 5 clover leaves.
6. On 6 clover leaves.
7. On 7 clover leaves.
8. On 8 clover leaves.
9. On 9 clover leaves.
10. On 10 clover leaves.
11. 2 threes are ——
12. 3 threes are ——
13. 4 threes are ——
14. 5 threes are ——
15. 6 threes are ——
16. 7 threes are ——
17. 8 threes are ——
18. 9 threes are ——
19. 10 threes are ——



1. Two villagers sat by a tree in Nursery Village. Three villagers were under another tree. How many villagers were there in all?
2. Three villagers and one villager were in front of a row of trees. In all there were —— villagers.
3. Three villagers were in the Nursery Flier and three more waited for a ride. How many in all?
4. Three big villagers and eight little villagers were talking on the corner. How many in all?
5. Three village dogs were chasing ten village cats. How many village animals were running?
6. Three village horses and twenty-one village cows were in a pasture. How many animals in all?
7. A street in Nursery Village had 3 green houses and 15 red houses. How many houses in all?

Little Bo Peep has a dozen sheep. Three of them are running away. The rest are following her. How many sheep are following Bo Peep?

If 3 more sheep run away, how many sheep will Little Bo Peep have left?

If Bo Peep has 11 sheep and sells 3 of them, how many will she then have?

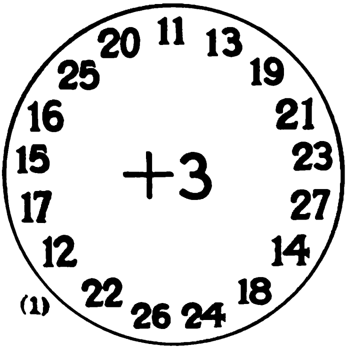
Bo Peep's father has 13 horses. If he sells 3 of them he will have —— horses.

Bo Peep's brother, Little Boy Blue, has 19 cows. He fell asleep and 3 cows got into the corn. How many did not get into the corn?

Bo Peep's mother has 15 hens. Only 3 are white. How many hens are not white?

Little Boy Blue has 18 rabbits. Three are sick. How many rabbits are well?

1.	1	2	3	4	5	6	7	8	9	10
+	3	3	3	3	3	3	3	3	3	3
2.	11	12	13	14	15	16	17	18	19	20
+	3	3	3	3	3	3	3	3	3	3
3.	21	22	23	24	25	26	27	28	29	30
+	3	3	3	3	3	3	3	3	3	3
4.	3	4	5	6	7	8	9	10	11	12
—	3	3	3	3	3	3	3	3	3	3
5.	13	14	15	16	17	18	19	20	21	22
—	3	3	3	3	3	3	3	3	3	3
6.	23	24	25	26	27	28	29	30		
—	3	3	3	3	3	3	3	3		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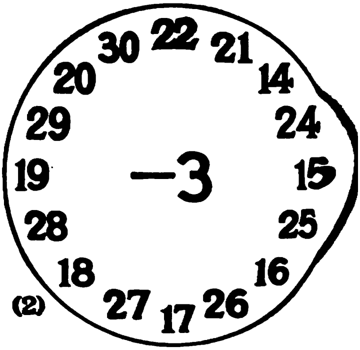
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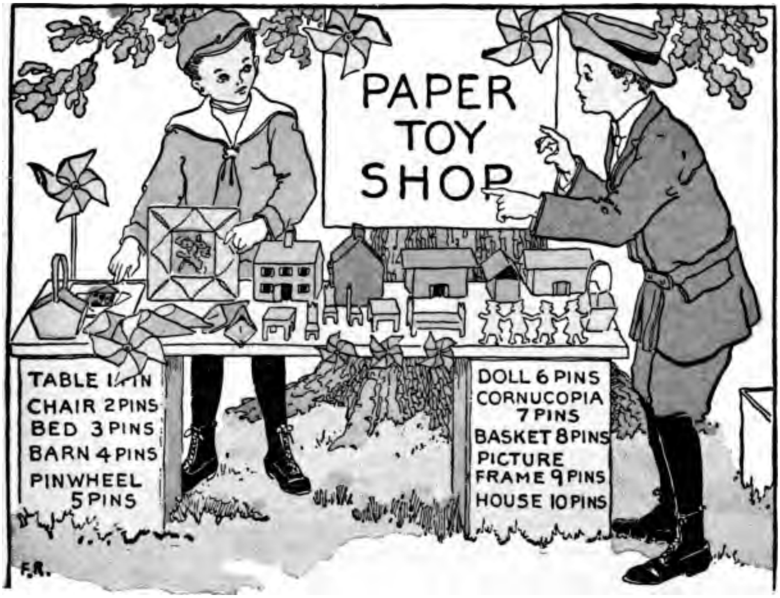
7. *Add* 3 to or subtract 3 from these numbers.



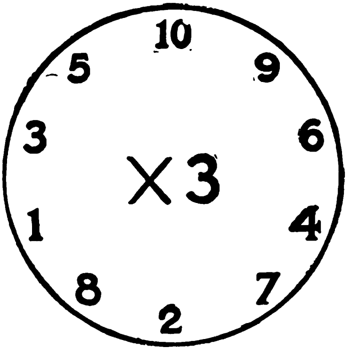
1. Peter is selling paper toys for pins. Read his price list.
2. What will Carl pay for 3 pinwheels?
3. For 3 picture frames he will pay —— pins.
4. Peter's sister bought 3 baskets for —— pins.
5. For 3 cornucopias she gave —— pins.
6. Carl's sister bought 3 dolls for —— pins.
7. 3 houses for the dolls cost —— pins.
8. 3 chairs cost —— pins.
9. 3 beds cost —— pins.
10. Carl bought 3 barns for —— pins.
11. He bought 3 tables for —— pins.
12. How many paper toys did Peter sell?

1. 2 × 3 = ———
3 × 3 = ———
4 × 3 = ———
5 × 3 = ———
6 × 3 = ———
7 × 3 = ———
8 × 3 = ———
9 × 3 = ———
10 × 3 = ———

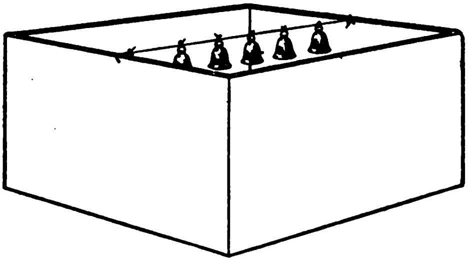
2. 3 × 2 = ———
3 × 3 = ———
3 × 4 = ———
3 × 5 = ———
3 × 6 = ———
3 × 7 = ———
3 × 8 = ———
3 × 9 = ———
3 × 10 = ———

3. ——— × 3 = 6
——— × 3 = 9
——— × 3 = 12
——— × 3 = 15
——— × 3 = 18
——— × 3 = 21
——— × 3 = 24
——— × 3 = 27
——— × 3 = 30

4. 3 × ——— = 6
3 × ——— = 9
3 × ——— = 12
3 × ——— = 15
3 × ——— = 18
3 × ——— = 21
3 × ——— = 24
3 × ——— = 27
3 × ——— = 30



5. What is 3 times each number around the circle



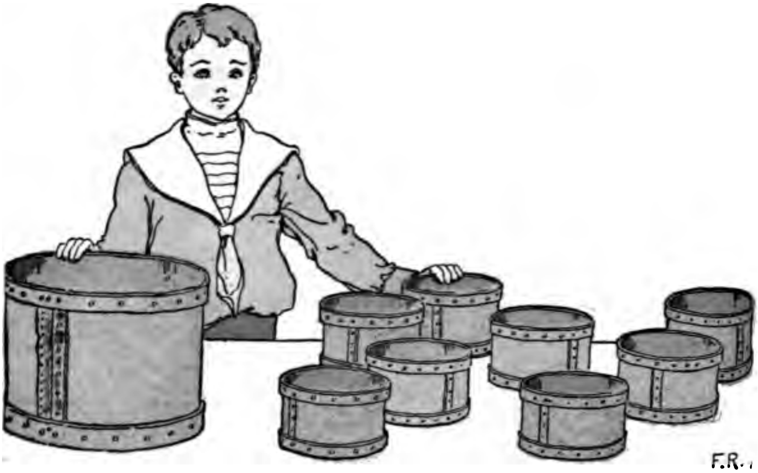
RINGING THE BELLS

Place a large pasteboard box on the floor. Remove the cover and put a string of little bells across the middle of the box as shown in the picture.

The children stand eight feet from the box and take turns trying to throw bean bags into it. One child stands near the box to take the bags back to the one who throws next.

If a player throws the bean bag so that it goes into the box without ringing the bells, he scores nine. If the bag hits the string of bells and then falls into the box the player scores six.

Score should be kept on the board by the pupils. The numbers counted for each throw may be changed from time to time.



1. Ralph's father is a grocer. He has measures like the ones in the picture for measuring vegetables and fruits. He lets Ralph use these measures in a play store.
2. The large measure is called a peck.
   Each small measure is called a quart.
3. Fill the quart measures with sand and empty them into the peck measure until the peck measure is full. How many quarts of sand does the peck measure hold?
   One peck = —— quarts.
4. How many quarts of sand will half fill the peck measure?
5. Ralph sells pebbles and horse chestnuts. He *makes believe* that they are fruit and vegetables.

Carrie buys one peck of nuts. How many quarts of nuts does she get?

For each quart she pays 2 toy cents. How much do the nuts cost her?

Helen buys one half peck of potatoes. How many quarts does she buy?

For each quart of potatoes she pays 2 toy cents. How many toy cents does she pay for one half peck?

Mabel buys one peck of apples. How many quarts of apples does she get?

At 3 cents a quart, what does the peck of apples cost her?

How many quarts are there in 1 peck?

How many quarts are there in 2 pecks?

How many quarts are there in 3 pecks?

Ralph has a peck of tomatoes. He sells 3 quarts of the tomatoes. How many quarts of tomatoes remain?

Carl picks one peck of berries. Frank picks 3 quarts of berries. How many quarts of berries do both boys pick?

Donald gathers one peck of chestnuts. He gives one half of the nuts to his brother. Donald has —— quarts of chestnuts left.

How many quarts are there in one and one half pecks?

"OF WHAT AM I THINKING?" GAME

1. A child stands facing the class and says, "I am thinking of two numbers which make nine. What are they?"

   Pupils take turns guessing the numbers.

   One may ask, "Are they seven and two?" Another may ask, "Are they 4 and 5?"

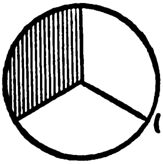
   The child keeps standing in front of the class until the right answer is guessed.

2. Another child stands and says to the class, "Of what am I now thinking in the table of twos?"

   One of the pupils may make the guess, "Is it 2 × 7 are 14?" Another may ask, "Is it 2 × 9 are 18?"

3. In the same way, another child says, "I am thinking of one half of a number. What is the number and what is one half of it?"

   One guess may be, "Is it one half of twelve is six?" A second guess may be, "Is it one half of sixteen is eight?"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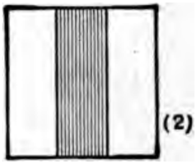
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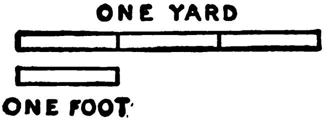


(3)

1. Into how many equal parts is the circle divided? (1) Each part is called one third.
2. What part of the square is dark? (2)
3. Figure (3) is a picture of a yard stick and a foot rule. Place foot rules on top of a yard stick, end to end. How many foot rules does it take to cover the yard stick?
   One yard = —— feet.
   One foot is what part of a yard?
4. Lay a row of 3 cubes. Divide it into 3 equal parts.
   What is each part called?
   One third of 3 is ——
5. Lay a row of 6 cubes. Divide it into 3 equal parts.
   Count the number of cubes in each part.
   One third of 6 is ——
6. Lay a row of 9 cubes. Divide it into 3 equal parts.
   Count the number of cubes in each part.
   One third of 9 is ——

1. Cut a 6 inch strip of paper. Fold it in three equal parts. Each part is one third of — inches. Measure each third.

   One third of 6 inches is —— inches.

2. Cut a 9 inch strip of paper. Fold it in thirds. Measure each third.

   One third of 9 inches is —— inches.

3. Cut a 12 inch strip of paper. Fold it in thirds. Measure each third.

   One third of 12 inches is —— inches.

4. Cut a 15 inch strip of paper. Fold it in thirds. Measure each third.

   One third of 15 inches is —— inches.

5. Cut an 18 inch strip of paper. Fold it in thirds. Measure each third.

   One third of 18 inches is —— inches.

6. Cut a 21 inch strip of paper. Fold it in thirds. Measure each third.

   One third of 21 inches is —— inches.

7. Cut a 24 inch strip of paper. Fold it in thirds. Measure each third.

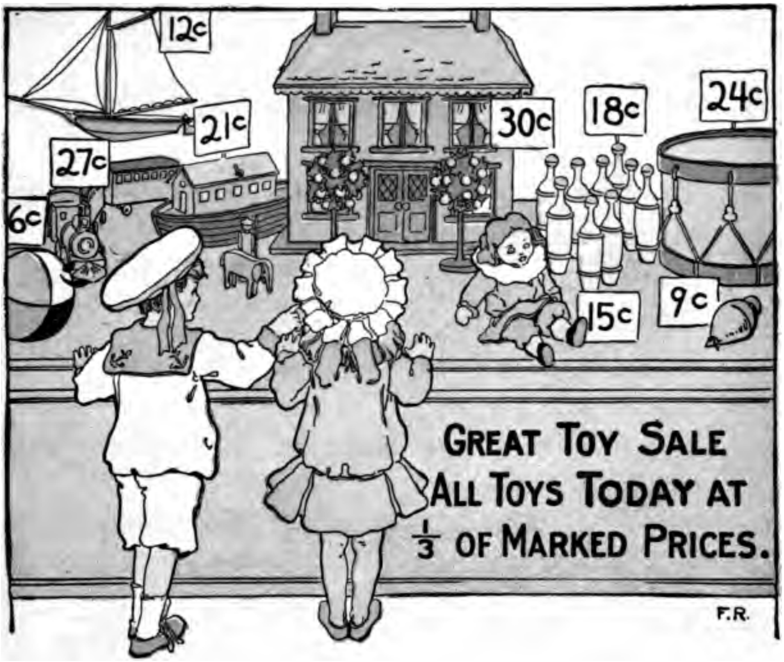
   One third of 24 inches is —— inches.

8. Cut a 27 inch strip. Measure one third of it.

   One third of 27 inches is —— inches.

9. Cut a strip 30 inches long. Fold it in thirds. Measure each third.

   One third of 30 inches is —— inches.

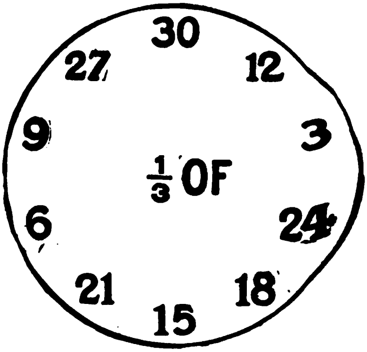


1. Rose and Robert are buying toys. The toys are being sold at $\frac{1}{3}$ of the marked prices.
2. The house will cost Robert —— cents.
3. The train will cost him —— cents.
4. What toy can he buy for 8 cents?
5. The ball will cost Rose —— cents.
6. The doll will cost her —— cents.
7. How much will the ark cost?
8. How much will the top cost?
9. How much will the nine-pins cost?
10. How much will the boat cost?

1. Draw a line one third of a foot long. How long is the line?
2. Draw a line one third of 15 inches long. Write its length.
3. Draw a line one third of 18 inches long. Write its length.
4. Draw a line one third of 21 inches long. Write its length.
5. Draw a line one third of 24 inches long. Write its length.
6. Draw a line one third of 27 inches long. Write its length.
7. Draw a line one third of 30 inches long. Write its length.

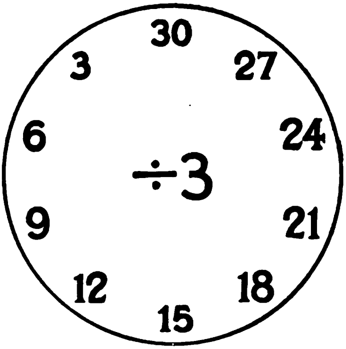
8. $\frac{1}{3}$ of 3 = ——
$\frac{1}{3}$ of 6 = ——
$\frac{1}{3}$ of 9 = ——
$\frac{1}{3}$ of 12 = ——
$\frac{1}{3}$ of 15 = ——
$\frac{1}{3}$ of 18 = ——
$\frac{1}{3}$ of 21 = ——
$\frac{1}{3}$ of 24 = ——
$\frac{1}{3}$ of 27 = ——
$\frac{1}{3}$ of 30 = ——

9. What is $\frac{1}{3}$ of each number around the circle.

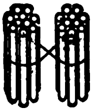


3 twos make ——
2 is $\frac{1}{3}$ of ——
3 threes make ——
3 is $\frac{1}{3}$ of ——
3 fours make ——
4 is $\frac{1}{3}$ of ——
3 fives make ——
5 is $\frac{1}{3}$ of ——
3 sixes make ——
6 is $\frac{1}{3}$ of ——
3 sevens make ——
7 is $\frac{1}{3}$ of ——
3 eights make ——
8 is $\frac{1}{3}$ of ——
3 nines make ——
9 is $\frac{1}{3}$ of ——
3 tens make ——
10 is $\frac{1}{3}$ of ——

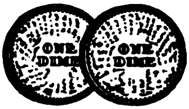
10. 2 is what part of 6?
11. 5 is what part of 15?
12. 8 is what part of 24?
13. 6 is what part of 18?
14. 3 is what part of 9?
15. 9 is what part of 27?
16. 4 is what part of 12?
17. 10 is what part of 30?
18. 7 is what part of 21?

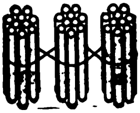


How many 3's are there in each number around the circle?

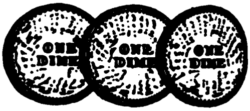


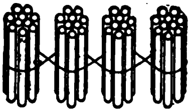
2 tens are twenty. 20.
2 dimes are 20 cents.



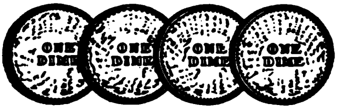


3 tens are thirty. 30.
3 dimes are 30 cents.

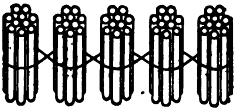




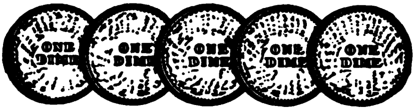
4 tens are forty. 40.



4 dimes are 40 cents.



5 tens are fifty. 50.



5 dimes are 50 cents.

1. Count quickly from twenty to thirty.
2. Count quickly from thirty to forty.
3. *Count quickly* from forty to fifty.

1. Read these figures:

14
50
34
12
44
27
35
33
39
21
20
36
23
13
15
37
48
26
38
43
22
30
18
24
28
25
49
41
16
29
40
32
46
31
45
42
47
19
17
11

2. Write these numbers in figures:

thirty-seven
forty-three
thirty-six
twenty-one
thirty-four
forty-five
forty-nine
twelve
twenty-four
forty-one
thirty-one
twenty-nine
seventeen
thirty
forty-two
forty-eight
thirty-two
fifty
forty-four
twenty-three
forty-six
thirty-five
thirty-eight
eighteen
thirty-three
sixteen
thirty-nine
fourteen
twenty-seven
forty
twenty-eight
forty-seven
thirteen
twenty-six
twenty
fifteen
twenty-two
nineteen
twenty-five

ADDING REVIEW

	9	9	9	9	9	9	9	9	9
+	1	2	3	4	5	6	7	8	9
	—	—	—	—	—	—	—	—	—
	8	8	8	8	8	8	8	8	8
+	1	2	3	4	5	6	7	8	9
	—	—	—	—	—	—	—	—	—
	7	7	7	7	7	7	7	7	7
+	1	2	3	4	5	6	7	8	9
	—	—	—	—	—	—	—	—	—
	6	6	6	6	6	6	6	6	6
+	1	2	3	4	5	6	7	8	9
	—	—	—	—	—	—	—	—	—
	5	5	5	5	5	5	5	5	5
+	1	2	3	4	5	6	7	8	9
	—	—	—	—	—	—	—	—	—
	4	4	4	4	4	4	4	4	4
+	1	2	3	4	5	6	7	8	9
	—	—	—	—	—	—	—	—	—
	3	3	3	3	3	3	3	3	3
+	1	2	3	4	5	6	7	8	9
	—	—	—	—	—	—	—	—	—
	2	2	2	2	2	2	2	2	2
+	1	2	3	4	5	6	7	8	9
	—	—	—	—	—	—	—	—	—

TABLES

1. 1 × 2 = 2
2 × 2 = 4
3 × 2 = 6
4 × 2 = 8
5 × 2 = 10
6 × 2 = 12
7 × 2 = 14
8 × 2 = 16
9 × 2 = 18
10 × 2 = 20
11 × 2 = 22
12 × 2 = 24

2. 2 ÷ 2 = 1
4 ÷ 2 = 2
6 ÷ 2 = 3
8 ÷ 2 = 4
10 ÷ 2 = 5
12 ÷ 2 = 6
14 ÷ 2 = 7
16 ÷ 2 = 8
18 ÷ 2 = 9
20 ÷ 2 = 10
22 ÷ 2 = 11
24 ÷ 2 = 12

3. 1 × 3 = 3
2 × 3 = 6
3 × 3 = 9
4 × 3 = 12
5 × 3 = 15
6 × 3 = 18
7 × 3 = 21
8 × 3 = 24
9 × 3 = 27
10 × 3 = 30
11 × 3 = 33
12 × 3 = 36

4. 3 ÷ 3 = 1
6 ÷ 3 = 2
9 ÷ 3 = 3
12 ÷ 3 = 4
15 ÷ 3 = 5
18 ÷ 3 = 6
21 ÷ 3 = 7
24 ÷ 3 = 8
27 ÷ 3 = 9
30 ÷ 3 = 10
33 ÷ 3 = 11
36 ÷ 3 = 12

MANUAL FOR

First Journeys in Numberland

BY

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MANUAL
FOR
FIRST JOURNEYS IN NUMBERLAND

THE CHILD'S BACKGROUND OF NUMBER

By the time a child enters school he has become acquainted with certain number facts rhythmically presented through Mother Goose rimes such as Five Little Pigs, Two Little Blackbirds, Three Little Kittens, etc., and through games and stories involving number.

He has associated the number idea with familiar experiences; *one* with the discovery of his mouth and nose; *two* with his eyes and ears; *three* with the wheels on his velocipede; *four* with those on his wagon or on automobiles; *five* and *ten* with his fingers and toes, and the pennies that make a nickel and a dime.

He is now ready and eager to enjoy a little work with numbers within his mental grasp, but such work must be presented in a simple, natural, and attractive fashion—using his interests and materials.

In his first journeys through Numberland the child encounters experiences, interests, and immediate needs of the home, school, playground, and community. Every numerical idea is presented through a concrete situation in the child's own world. The situations make use of toys, stories, exercises in construction, rhythmic counting, and the natural activities of childhood—games, plays, and dramatizations.

PRELIMINARY WORK

Before the book is put into the hands of the children, some preliminary work must be done in recognizing number groups, in counting, and in the use of a simple number vocabulary. *The teacher is advised not to let the children try to read the book until they can do* *so without much difficulty.* Otherwise the value of the number lesson will be lost, and the children will derive neither pleasure nor profit from it. The teacher should look through every lesson carefully and prepare for any word difficulties by perception cards or by short blackboard-drills. It is not desirable to teach all the new words in such a way as to make them a part of the child's vocabulary. The words are simply a means to an end, and it is perfectly legitimate to tell the child a word if he fails to get it after a reasonable drill. Don't let him lose the value of the number lesson because of poor reading.

SILENT READING

There are a number of pages in the book which may very profitably be used for silent reading, either under the direction of the teacher, or independently as seat work. The child gains much power by reading silently, solving the number problem, and recording the result on paper, or by giving it orally to the teacher. It must be remembered, however, that the value of such work will be absolutely lost unless the children can read such pages without difficulty. *Be sure* they know all the words before attempting it. Some pages suggested for silent reading are 32, 36, 43, 51, 52, etc. The teacher who knows her class will find others.

GENERAL SUGGESTIONS

Counting, Measuring, Grouping, and Drill—each of these parts of the work has an important service to render, if the number power is to be well balanced and complete. In counting and grouping numbers, appeal to the ear as well as to the eye. Tap on desk, on bell, on tin, glass, wood, etc. Count the number of double strokes, of triple strokes, etc.

When the child is ready for problems, let them be on every topic of compelling interest to him: *Christmas* trees, candles, trimmings, gifts; *Easter* bunnies, baskets, eggs, cards; *Valentines,* buying, send*ing, stamping,* mailing, receiving; *Thanksgiving* feasts, fruits, vegeoles, jack-o-lanterns, games; *Circuses,* animals, clowns, tents, sideows; *Picnics,* the coaster, merry-go-round, contests, sports, food; *cursions,* preparation, tickets, traveling, time, distance; ***Parties,*** kes, candies, ice cream, presents; and so on endlessly.

Correlate with your talks on citizenship, problems on thrift (sav-g for a definite purpose); helpfulness; feeding pets; gardening and rming; the work of the postman, policeman, street-cleaner, fire-n, etc.

Do not mistake the means for the end and allow games, dramatiza-n, plays, and other activities to take the place of real number work. eir purpose, a very important one, is to afford motivated drills, mulate interest, and secure clearness of imagery.

In addition to the above general suggestions, the following specific ints are offered the teacher:

Read the introduction and the teaching suggestions, pages 7-15 in text.

Do not hurry. Note the weaknesses of individual pupils, and review similar work during the next class period.

Introduce new ideas through familiar situations—dramatization, keeping store, buying, etc. Encourage originality of suggestion and expression.

Let the children illustrate their work whenever it is possible, either with objects such as shells, pebbles, cubes, splints, etc., with pencil and paper, or with paint box and brush.

To fix the number facts use perception cards. Add a new card for each new fact brought out. Flash daily for short periods.

Take a book for your desk copy. Go over it page by page and write on the margin of every page in figures the various facts brought out on that page, e. g., page 23: 1 and 1 and 1 are 3; $3-2=1$; or page 38: 1 and $1=2$, 2 and $2=4$, etc. Also write *on the margin* your own ideas or those suggested by others.

7. The book is expected to be in the hands of the children during the recitation, except when the teacher is giving a preliminary lesson.
8. It is *necessary* for the teacher to know the lesson beforehand and to have needed material ready.
9. *Always* take up any new phase of the work with the class in recitation. *Never give first* as seat work.
10. Supplement the page with your own carefully thought-out ideas.
11. Allow many to work at a time.
12. Use newspapers for cutting where large measurements are needed, if you have nothing else.
13. Make much use of calendars with large figures.
14. Have children for occupation put a "flat wash" on several sheets of drawing paper, using primary colors. Later, these sheets may be used as colored paper for cutting, pasting, and constructing.
15. Cut strips, squares, and oblongs of various sizes and widths for children to measure. Form problems about these strips. Later have pupils draw a line, a square, or an oblong (on the blackboard) of same size. They can also cut similar forms from various colored wrapping papers.
16. Collect and save heavy colored twine, tape, or ribbon which comes in a box of handkerchiefs, etc., for measuring.
17. Collect spools, horse-chestnuts, shells, flat pebbles, button-molds, seeds, sticks, beans, splints, etc., for counting.
18. Construction work may be distributed somewhat differently from the book arrangement, if desired, but be careful not to omit anything. Rather let what the book contains be suggestive of more of the same kind.
19. Relate numbers first to tangible and present things, then apply to familiar but absent things, and finally review in the abstract.
20. *Do not drill* on pages containing abstract number facts until the

work is perfected, because the same facts are taken up repeatedly, and are acquired through added experience.

1. Give every child every experience. It is not enough for a group to watch the teacher or pupil.
2. Great care should be taken that the children work *definitely* and *to some end,* in all they do. By doing, they will develop skill, as well as accuracy and *rapidity of thinking.*
3. The language also should be an important element. The children should be required to state in simple, clear, and definite language all they do, and be able to tell *why* they do it.

HOW TO BEGIN THE BOOK

A new book! How anxious the children are to handle it! How eager they are to look at the cover design and at the picture on its pages! The wise teacher will grasp this opportunity when interest is keen, and use it to good purpose.

When the book is first put into the hands of the children, give them a few minutes to examine it for themselves. Do not lessen the joy of discovery by asking questions immediately. Then gradually, by animated and skillful questioning, lead them to examine it more carefully and in detail; somewhat as follows:

First, let us look at the cover. Can anyone read the name of our book? With a little help, someone will doubtless be able to read the title. What is meant by "Journeys"? Talk about journeys—the joyous anticipation, the eager planning, the careful packing, the happy start, and at last the pleasant journey itself.

Some picture books take us on delightful journeys to Fairyland, where we meet Cinderella, Tom Thumb, Sleeping Beauty, Red Riding Hood, and many other fairy friends.

Our book will take us on a journey to Numberland. What is meant by "Numberland"? The teacher may compare with "Slumberland," the land of sleep, "Fairyland," the land of fairies, and "Wonderland," the land of wonders. Some child will probably see that Numberland is the land of numbers.

Look again at the cover picture. Do the children seem sad or happy? All the children in the book are happy as they play games, make houses and furniture, and do other pleasant things. So let us be happy and enjoy our journey through Numberland.

Look at the boy on page 17. Do you know where you have seen him before? He came from Mother Gooseland to greet the children

Numberland. He is dressed like Little Boy Blue, and so we may call n by that name, if we wish. We will learn how quickly he caught hare and how quickly he let it go again.

Look at the picture of the Three Bears on page 18. They are the st animal friends to greet us in Numberland. Soon we will read out them and find out what they are doing in our book.

Look at the children on page 21. What have they in their hands? e, too, will have some fun with a ruler, as we journey along.

Find page 29. What is a house doing in Numberland? Do you ink the Three Bears lived in this house? Does the carpenter who ilds a house use numbers? When? Look carefully and find some rniture for the house.

Turn to pages 34 and 35. What do you see in the two pictures? hat does money have to do with numbers? We learn how to use oney in Numberland.

Look at page 47. Does the boy who makes a kite have to use num- rs? How?

See page 92. What are these children doing? Do we use numbers hen we play games? How?

Now find page 127. Little Bo Peep does not see that some of her eep are running away. By and by, how can she tell that some are issing?

Do you like to visit a toy shop? See the dolls' clothing store on ge 102; the dolls' furniture on page 114; all sorts of toys on page 20; the paper toys on page 129; the great toy sale on page 137. Why es the toy shop man need to know about numbers? Why do you ed to know about numbers when you go to the toy shop to buy?

Look at page 122. Why must the grocer know about numbers?

Does your father have to know about numbers? Does your mother? hy?

You see that all of us have to know about numbers both for work and for play.

And now we are ready to start on our journey through Numberland.

SUGGESTIONS BY PAGES

In beginning the first few pages, it may be best for the teacher to do the reading, while the pupils follow with open books.

Page 17. Dramatize, or have the children recall many Mother Goose rimes involving number. Have the children do the counting suggested in the rime. Wee Willie Winkie, Ten Little Indians, Peas Porridge Hot, and One, Two, Buckle My Shoe, are a few typical rimes that could be used.

Seat Work: Free-hand cutting or drawing of animals and objects mentioned in rimes.

Pages 18-19. Tell the story of the Three Bears, or have the children tell it. Compare heads, feet, paws, clothes, etc. Sketch on the blackboard other objects in the Bears' home and have pupils compare them. Supplement these pages by such questions as, "Which is the tallest building you can see from the window?" "Which is the tallest tree?" Lead children to compare other objects near them.

Seat Work: Free-hand cutting, drawing, or crayoning of bears, bowls, plates, etc.

Page 20. Compare other objects in the school room. Three children stand. Which is tallest; shortest? Three children raise hands. Which is highest; lowest? Which child is nearest the door; nearest the window?

Page 21. Have a short talk on the ruler. Who use it? (Carpenters, paper-hangers, tailors, etc.) Discuss the kinds of rulers the children have seen, whom they have actually seen using them, what a convenience they are, etc. Open the window one foot. Open the door one foot. Now measure these openings with the ruler. Is the distance more or less than one foot?

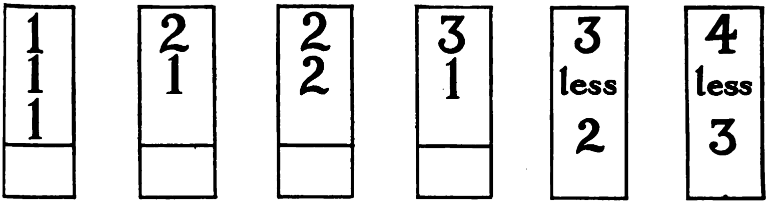
Draw several lines on the blackboard. Make some exactly one foot long, others shorter, others longer. Pupils make estimates. Measure to see who is most nearly right. Play a game estimating lengths.

Have on hand several squares cut from newspapers—some 1-foot squares, and others smaller and larger. Children select 1-foot squares. Select any one of the other squares and tell whether it is larger or smaller than the foot square.

Page 22. Do not attempt to accomplish this in one day; extend over a period of days, if necessary. Have your material ready beforehand. Let the children work in twos, a quick child and a slow child. Allow them to work at this before school or in one or two groups while you are hearing a class. Every child should do some measuring.

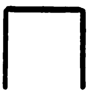
Page 23. Note the number facts brought out on this page, e. g., 1 and 1 and 1 are 3; 2 and 1 are 3; 2 and 2 are 4; 3 and 1 are 4; 3 less 2 is 1; 4 less 3 is 1.

Make perception cards for this page, similar to the figures shown below, and use them in connection with this work.

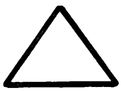


Seat Work: Arrange splints or tooth-picks to form objects, e. g., (1 and 1 and 1):

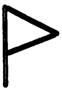
STOOL



COOP



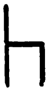
FLAG



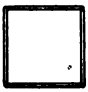
LETTERS

(3 and 1):

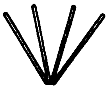
CHAIR



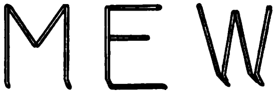
BOX



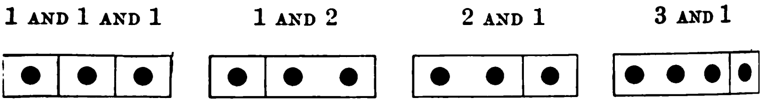
FAN



LETTERS

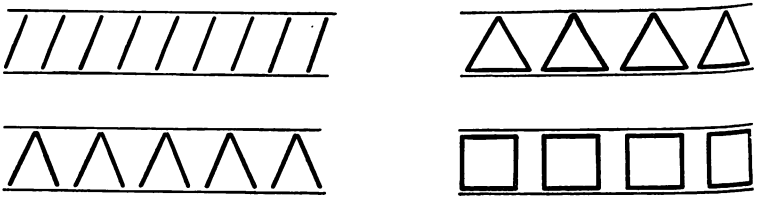


Arrange counters to illustrate new number facts, e. g.,



Page 24. It is necessary that ample material be supplied for this lesson. Have different colored strips of paper suspended around the room. If it is not possible to get different colors, use wrapping paper or newspapers. The better the material, the more profitable and interesting the lesson. Note new number facts brought out on this page and add perception cards. Give commands using "first, second, third, and fourth," e. g., "First row, stand; third row, turn; second row, raise one hand; fourth row, raise both hands."

Seat Work: Make designs on desk, using one splint for the first design, two splints for the second design, three for the third, and four for the fourth, as indicated in the figure.



Page 25. Measure other things than those suggested on the page. Encourage the children to do this when they first come in from the playground.

Game: Guess! Divide the class into two lines facing each other. Select a strip of paper from a box or basket and hold it so that all can see. The first child may say, "Two feet." If correct, the child opposite guesses the length of the next strip shown. Every correct guess scores one for the side on which the player stands. Keep score on the blackboard. Strips must be prepared beforehand, and several strips of the same length should be used. Teach the word "equal." *Cut strips* 1 foot, 2 feet, 3 feet, 4 feet, and 5 feet long.

Page 26. This work can be carried farther than 5. Games should be adapted to the ever increasing knowledge of the children.

Seat Work: Children can make these cards for seat work by having the book before them for copy.

Page 27. Use throughout the term, making additions as desirable. Make it a thing of importance to the children. Later you may wish to make a book with a larger number of pages.

Pages 28-29. Give as seat work after having been used in class. Encourage originality. Direct the class to make things from the box form; to add blinds, chimneys, ells, porches, to house. The house may belong to the Three Bears. The box may be their wood-box. Even if every child doesn't get a finished product, his effort is worth while if he has done his best.

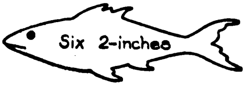
Page 30. Provide pupils with paper rectangles (newspaper or brown wrapping paper) 1 inch by 1 inch, 2 inches by 1 inch, 3 inches by 1 inch, 4 inches by 1 inch, 5 inches by 1 inch, 6 inches by 1 inch. Compare, using longer, shorter, smaller, larger, equal, etc. Make 1 foot by laying 2 smaller strips end to end; 3 strips, 4 strips, etc. Make 6 inches by putting end to end 3 smaller strips; commend pupils who succeed in doing this in two or three ways. Allow the children to put strips together and tell what they have made.

Seat Work: By following directions written on the blackboard, he children can rule 3 green lines six inches long, 4 red lines three nches long, etc.

Page 31. This might first be made a larger size. It might be the able belonging to the Three Bears.

Page 32. This makes a good page for silent reading, the children reading and performing the actions, while the teacher watches, and asks the questions which are given on the page. Before assigning Silent Reading Work, read again the suggestions on page 148.

Game: Fishing. Cut several 12-inch fish out of old pasteboard boxes *or any stiff* cardboard. On each fish write one of the number facts brought out on this page: 6 inches and 6 inches; 2 inches and 2 inches and 2 inches and 2 inches and 2 inches and 2 inches; 4 inches and 4 inches and 4 inches; 3 inches and 3 inches and 3 inches and 3 inches; 1 inch and 1 inch and 1 inch and 1 inch and 1 inch and 1 inch and 1 inch and 1 inch and 1 inch and 1 inch and 1 inch and 1 inch; two 6-inches; six 2-inches; three 4-inches; four 3-inches; twelve 1-inch. Use wastebasket for fish pond. The children form a circle around the pond. The teacher, outside of the circle, taps a child on the shoulder and says, "Henry may fish." The player addressed runs to the pond and catches a fish (picks out one). He must give the result of the number combination which he finds on his fish, when the teacher asks, "How long is your fish, Henry?" If he cannot give the correct answer the fish must go back into the pond.



Page 33. See page 31. This may be a chair from the Bears' house. Ask questions during construction, e. g.,

How many rows of squares in the 4-inch square?

How many squares in each row?

After cutting off one row of 4 squares, how many rows are left?

After cutting off a row of 3 squares, how many are left?

Count all the squares that remain. How many?

Measure around the chair seat. How many inches?

How large a cushion will cover the seat? Etc.

Pages 34-35. If you have no paper money, use real money, which is better. Teachers sometimes get a dollar's worth of pennies, nickels, and dimes. Separate the children into groups of ten or fifteen, giving each one a nickel or dime. Play store. It is very important that *each pupil* should take active part. Write a price list on the blackboard where all can see it. Change articles and prices frequently. Today *have a stationery store with the following articles:*

Stationery Store

Kites, Games, Dolls, Pop Corn	5 Cents
Tops, Balls, Bats, Whistles	4 Cents
Pads, Pencils, Erasers, Pens	3 Cents
Stamps, Marbles, Crayons, Ink	2 Cents
Post Cards, Candy, Stamps, Envelopes	1 Cent

Each player has a dime or a nickel, which he may spend buying whatever he chooses, e. g., "A kite and a bag of pop corn," or "A whistle, a pencil, and a 2-cent stamp."

Select a child for store-keeper. He must tell whether or not the buyer is correct, e. g.,

Buyer: "I will take a top, a game, and a stick of candy." (Hands store-keeper one dime.)

Store-keeper: "4 cents, 5 cents, and 1 cent are 10 cents."

When the store-keeper makes a mistake, choose another to take his place.

Dramatize selling newspapers. Give each child a nickel.

Newsboy: "Papers! Papers! *Post, News,* and *Call!*"

Buyer: "How much are they?"

Boy: "*Post,* 3 cents; *News,* 2 cents; and *Call,* 1 cent."

Buyer: "Give me a *News,* please." (Hands boy a nickel.)

Boy: (Supplied with pennies) "Here's your change, 3 cents."

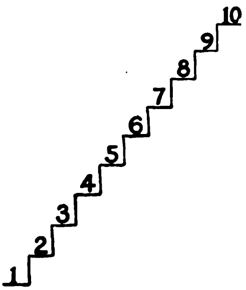
Give every player a chance to buy or sell. Choose a different newsboy when the one playing makes the wrong change.

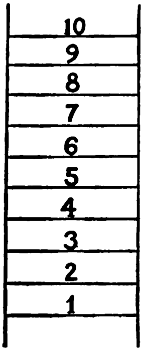
Page 36. This makes a good silent reading exercise. The children read silently, perform the action of counting, and tell the teacher the result.

This page also gives an opportunity for sense training exercises involving number.

1. Teacher may tap on desk, book, glass, metal, etc. Children listen with closed eyes, and tell number of taps.

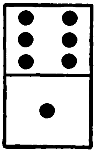
2. Send a pupil from the room and have him rap on the door. Others listen. The child who gives the correct number of raps, when called upon, may open the door.





If further drill on counting is needed, draw on board a figure of stairs, or of ladder, as in the illustration given. Have children run up the stairs, or climb the ladder quickly, without falling. The work can be varied by changing the position of the numbers.

Page 37. Talk about the domino cards on this page. How many cards? How arranged? On each card how many dots above the line? How many dots below? How many dots in all? Such questions direct the child's attention.



Seat work: If the teacher wishes, the children may now cut these cards by exact measurement and make. Use other cards and devices for quick recognition. Dramatize groupings, e. g: seven children run quickly and quietly to the front of the room. Six group themselves in 2 rows of three. One child stands a few feet away from the others.

Game. Children form a circle with one in the center. The child in the circle throws a soft ball to a player in the ring and at the same time calls a number, e. g., "5." The child to whom the ball is tossed must give a combination making "5," as he catches, "3 and 2," etc.

Page 38. The children may solve these problems by reading orally, silently, or as written seat work. Before assigning as seat work or as silent reading, be sure they know all the words.

Page 39. At first the child will be likely to make such number stories as: 1 rabbit and 2 rabbits are 3 rabbits. Lead him (by example) to make such stories as: there is a mother rabbit with two baby rabbits; there are three rabbits in all.

Seat Work: Let pupils illustrate their problems for seat work, by *cutting, drawing,* crayoning, or painting.

Pages 40-41. 6 inches by 8 inches is a good size. Large figures cut from calendars should be neatly pasted on cards. Cutting may be done for seat work.

Page 42. This can first be done with larger dimensions. Bring out number facts; e. g., if 4 squares are cut off, how many remain? Count by 3's, 4's, etc. Find perimeter (distance around). May be the bed of Baby Bear.

Page 43. Teach meaning of ——— (blank), by using "what" or "how many."

After drill with the circle, the rest of the page may be used for silent reading or for seat work.

Pages 44-45. For the more immature children use a 6-inch instead of a 10-inch square, if you wish. Use for a seasonal picture, if "Birthday Gift" seems inappropriate.

Page 46. It is important that each child should have material, and do what is asked; and that all should be working at the same time. If it is impossible to obtain cubes, use inch squares cut from pasteboard.

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Page 51. This may be used as a socialized recitation. One child whom the teacher chooses may answer the first question. He then calls on some other child to answer the next. The second child answers and calls on a third, etc.

Game: Simon Says. Prepare cards each bearing one of the number problems of this page. Children stand in a ring around another player, who holds the pack of cards. He shows one card and calls on a player in the ring to answer. When the answer is correct all thumbs should turn up; if incorrect, all thumbs should turn down. The first pupil to turn thumbs down when a wrong answer is given, shows the cards the next time. (Cards should be large with calendar figures pasted on them.)

Page 52. Part of this page may be used as silent reading, under the supervision of the teacher. The pupils may read and perform the action, after which the teacher asks the questions.

Page 53. Teach pupils to arrange problems thus, for seat work:

2	1	3
1	2	2, etc.
—	—	—

Pages 54-55. The teacher should look through these pages carefully for word difficulties before the children try to read them, and should prepare the pupils for new words. If more problems are needed, the teacher may cut pictures from magazines, paste them on paper, and write problems beneath for supplementary work in class or for seat work. Children can be taught to cut and mount pictures and make their own problems on certain numbers designated by the teacher, or suggested by the picture.

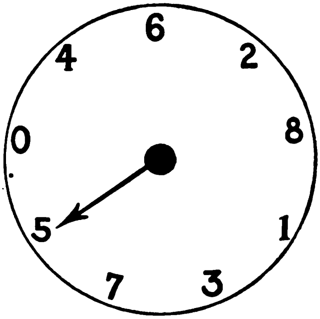
Page 56. Let the children illustrate as previously suggested, or use in any way the teacher desires.

Page 57. This page needs careful development. Give much blackboard work, having the children substitute signs + and = for words "and" and "are." Make flash cards using sign +. Use devices for drill; e. g., sketch quickly on the board several apples and on each write a combination. See how many apples can be picked, etc.

Do not repeat a device until interest lags. Use new ones.

The teacher can sketch while listening. Snow flakes, that melt; balloons, that escape; flowers, that may be gathered; etc.

Game: Spin the Needle. Cut a large circle from heavy cardboard. Paste calendar figures around the edge. Cut a cardboard needle, or pointer, and attach it with a paper fastener to the center of the circle. Spin the needle and add two to the number nearest which the need



stops. The class may be divided as for a spelling match, and the sides may play against each other. Keep score on blackboard.

Page 58. Name things we buy by 2's, e. g., ear-rings, gloves, socks, stockings, shoes, skates, etc. Two of a kind make a pair. Talk about other pairs, e. g., wings of birds, horns of animals, a team of horses, etc.

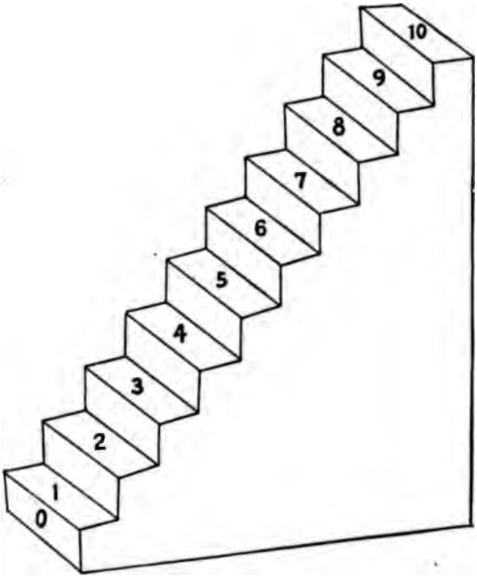
Count by 2's, eyes, ears, hands, feet. March by 2's.

Listen to the clock. Count "tick-tock" five times, six times, etc.

Count by 2's other objects in the room—books, pencils, desks, etc.

Draw stairs on the blackboard, similar to the accompanying illustration. Ask pupils to go up these stairs as follows: Start on the floor and go up 2 steps at a time, e. g., 2, 4, 6, etc. Start on the first step and go up 2 steps at a time, e. g., 1, 3, 5, etc.

Page 59. Let as many work as possible, at the board, or on paper.



Page 60. If the teacher prepares for word difficulty, this page may be read silently, and the answers given orally to the teacher, or the *problems may be used* as written seat work. Follow by drill on number *facts.*

Page 61. Precede by blackboard lesson, using "take away" followed by "less," if "less" is not easily comprehended. Teach pupils to read the text putting the correct answer in place of ————. See suggestions for page 57. Make flash cards using sign —.

Page 62. Anticipate this page. A target made by the children is more valuable than one made by the teacher. The target may be made on a barrel head, mounted on sticks. Encourage suggestions from the children. Call on a higher grade to coöperate in a problem of this kind. Continue to use the target game, changing the number value of circles as the child's knowledge increases.

Page 63. See suggestions for pages 33 and 42.

Make problems about the fruit, nuts, vegetables, etc., stored in the barn. Tell number stories about the animals.

Page 64. If it is possible for the children to read this page, let them do the work as seat work. It will be a valuable test, and will show what power the pupils have acquired. Supplement by study work period, having each child make what he chooses from the box form.

Page 65. Before using this page, let the children make toy pennies by cutting as seat work little circles from light cardboard. Pupils may read silently, perform the work, and then answer the questions orally, as previously suggested. All the children should be working at the same time, not watching the teacher or another pupil.

Page 66. Let children make squares for use on this page or use any other available material.

Page 67. This page may be used for silent reading, oral reading, or for written seat work. If used as seat work, children may rewrite, using the signs +, —, and =, which have been previously taught. Use flash cards or some other device for drill.

Page 68. Children may make price tags by using calendar numbers mounted on little cards, and play store with articles brought from home. Toys can easily be made from vegetables: put four toothpick gs on a lemon and stick in two tacks for eyes and you have a fine pig.

a potato with eyes, nose, and mouth cut out, and a tiny chicken feather stuck into the top makes a fine Indian, and so on. The wonderful display may be held in a make-believe tent. Two chairs may represent the entrance, and each visitor must pay 3 cents admission. Each visitor may purchase an article, and holding it so that all can see, tell a number story about it; e. g., "I paid 3 cents admission and bought this lemon pig for 6 cents. I paid 9 cents in all. I had a dime, and so there is one cent left."

Page 69. After a drill with circles children may use this page as seat work.

Page 70. This can be a Memorial Day or a Washington's Birthday frame just as well as a Christmas frame.

Page 71. The practice of preceding lessons should make it easy for some of the groups to measure and cut, instead of fold and cut.

Decorate your school room for Washington's Birthday, Flag Day, Memorial Day, or Columbus Day. Make chains of red, white, and blue paper. Chains for Thanksgiving should be orange and green.

Page 72. Make this seasonal, if it does not happen to be Christmas. Print the names of the months if calendars cannot be obtained.

Devices for drill on names of months.

1—Write the name of each month on a card. Place cards upon chalk tray. Children put heads down and close eyes while teacher removes a card. At a signal children look up, and try to find which month is missing.

2—The cards are placed as before. As the teacher points to a card the child gives the name of the month and tells the season to which it belongs.

On a large printed calendar mark in *red* these days:

New Year's Day
Washington's Birthday
Flag Day
Memorial Day
Fourth of July
Labor Day
Armistice Day
Thanksgiving Day
Christmas
Easter

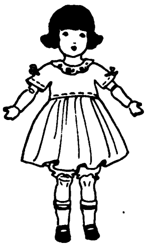
Supplement the calendar work by teaching how many days in a month, how many weeks, how many days in a week, how many school days, and other number facts.

Pages 73-74. Name according to season. Teacher makes the cornucopia and wall pocket with the class, as she gives directions very slowly. Or she may draw a picture of each step on blackboard, making pictures larger, but keeping the proportion.

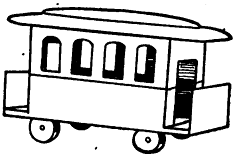
Page 75. Precede this race by a review. Flash cards, etc.

Page 76. If small cubes are not available, perhaps some child has a set of A B C blocks at home which he could bring for the use of the whole class around a table or on the teacher's desk.

Pennies might be used instead of cubes. One dollar in pennies would permit the teacher to work with groups of ten around the table.



4 cents



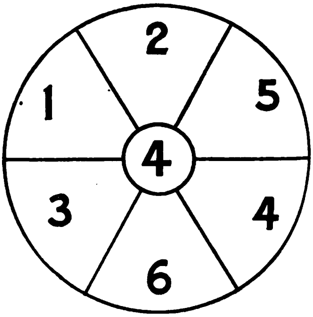
5 cents

From advertisements cut out pictures of toys, and mount them on cards, adding various prices. Allow child to buy two toys, one of which costs 4 cents. Tell the amount of the purchase.

Have pupils make problems, using 4's, e. g., shoes on horses, wheels of wagons, tires on automobiles, legs of animals, etc.

Page 77. Use in any way desired. For oral recitation each pupil may cover the written work below each domino with a piece of paper, and then give all the number facts that each suggests to him.

Game: Blind Man's Wheel. A player closes his eyes and points to the wheel, which has been drawn on the blackboard. If he touches a line the count is 0. After pointing he opens his eyes and adds 4 to *the number nearest* the end of his pointer.



Pages 78-79. See previous pages of similar nature.

Page 80. It may be well to take this up first on the blackboard, as the children are inclined to add the number above the line instead of making it the sum.

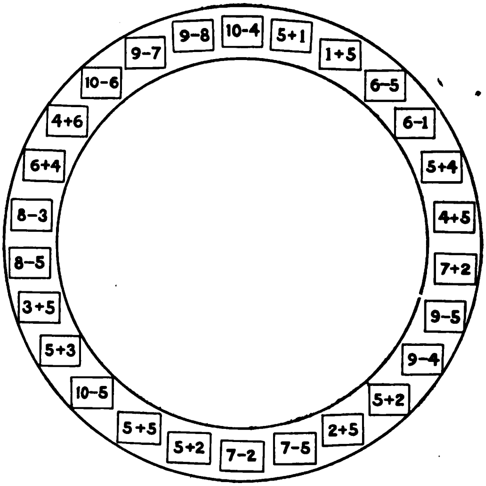
Game: What Is Missing? Teacher stands in the center of a circle. She gives a number which is to be the sum of two numbers, e. g., "9." Then she tosses a soft ball or bean bag to a child, at the same time giving one part of the combination that makes "9," e. g., "6."

The player to whom the ball is thrown should give the other part of the combination, e. g., "3," as he catches it.

When a player fails, he must stand within the ring, until he answers correctly when another makes a mistake.

Page 81. Children may well make this a socialized recitation. Let one child give the first answer, and then call on another child. The second child gives the next answer and calls on another, etc. Children must watch and correct each other's mistakes.

Device: The Ferris Wheel. The teacher may draw on the blackboard two large circles, one within the other. (See cut.) Between the circles draw small rectangles for cars, and write in each a number fact for drill. As teacher points, see who can ride around the wheel without making it stop. Of course the wheel stops whenever a pupil makes a mistake. See who can make the wheel turn the fastest by reciting the quickest.



facts brought out on this page: 6 inches and 6 inches; 2 inches and 2 inches and 2 inches and 2 inches and 2 inches and 2 inches; 4 inches and 4 inches and 4 inches; 3 inches and 3 inches and 3 inches and 3 inches; 1 inch and 1 inch and 1 inch and 1 inch and 1 inch and 1 inch and 1 inch and 1 inch and 1 inch and 1 inch and 1 inch and 1 inch; two 6-inches; six 2-inches; three 4-inches; four 3-inches; twelve 1-inch. Use wastebasket for fish pond. The children form a circle around the pond. The teacher, outside of the circle, taps a child on the shoulder and says, "Henry may fish." The player addressed runs to the pond and catches a fish (picks out one). He must give the result of the number combination which he finds on his fish, when the teacher asks, "How long is your fish, Henry?" If he cannot give the correct answer the fish must go back into the pond.

Page 33. See page 31. This may be a chair from the Bears' house. Ask questions during construction, e. g.,

How many rows of squares in the 4-inch square?
How many squares in each row?
After cutting off one row of 4 squares, how many rows are left?
After cutting off a row of 3 squares, how many are left?
Count all the squares that remain. How many?
Measure around the chair seat. How many inches?
How large a cushion will cover the seat? Etc.

Pages 34-35. If you have no paper money, use real money, which is better. Teachers sometimes get a dollar's worth of pennies, nickels, and dimes. Separate the children into groups of ten or fifteen, giving each one a nickel or dime. Play store. It is very important that *each pupil* should take active part. Write a price list on the blackboard *where* all can see it. Change articles and prices frequently. Today *have a stationery* store with the following articles:

Stationery Store

Kites, Games, Dolls, Pop Corn	5 Cents
Tops, Balls, Bats, Whistles	4 Cents
Pads, Pencils, Erasers, Pens	3 Cents
Stamps, Marbles, Crayons, Ink	2 Cents
Post Cards, Candy, Stamps, Envelopes	1 Cent

Each player has a dime or a nickel, which he may spend buying whatever he chooses, e. g., "A kite and a bag of pop corn," or "A whistle, a pencil, and a 2-cent stamp."

Select a child for store-keeper. He must tell whether or not the buyer is correct, e. g.,

Buyer: "I will take a top, a game, and a stick of candy." (Hands store-keeper one dime.)

Store-keeper: "4 cents, 5 cents, and 1 cent are 10 cents."

When the store-keeper makes a mistake, choose another to take his place.

Dramatize selling newspapers. Give each child a nickel.

Newsboy: "Papers! Papers! *Post, News,* and *Call!*"

Buyer: "How much are they?"

Boy: "*Post,* 3 cents; *News,* 2 cents; and *Call,* 1 cent."

Buyer: "Give me a *News,* please." (Hands boy a nickel.)

Boy: (Supplied with pennies) "Here's your change, 3 cents."

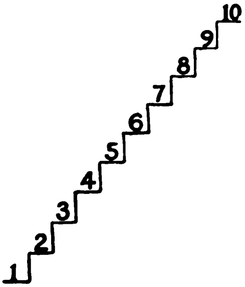
Give every player a chance to buy or sell. Choose a different newsboy when the one playing makes the wrong change.

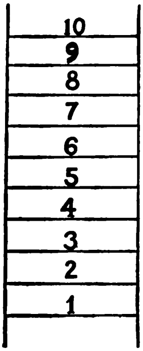
Page 36. This makes a good silent reading exercise. The children read silently, perform the action of counting, and tell the teacher the result.

This page also gives an opportunity for sense training exercises involving number.

1. Teacher may tap on desk, book, glass, metal, etc. Children listen with closed eyes, and tell number of taps.

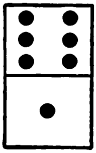
2. Send a pupil from the room and have him rap on the door. Others listen. The child who gives the correct number of raps, when called upon, may open the door.





If further drill on counting is needed, draw on board a figure of stairs, or of ladder, as in the illustration given. Have children run up the stairs, or climb the ladder quickly, without falling. The work can be varied by changing the position of the numbers.

Page 37. Talk about the domino cards on this page. How many cards? How arranged? On each card how many dots above the line? How many dots below? How many dots in all? Such questions direct the child's attention.



Seat work: If the teacher wishes, the children may now cut these cards by exact measurement and make. Use other cards and devices for quick recognition. Dramatize groupings, e. g: seven children run quickly and quietly to the front of the room. Six group themselves in 2 rows of three. One child stands a few feet away from the others.

Game. Children form a circle with one in the center. The child in the circle throws a soft ball to a player in the ring and at the same time calls a number, e. g., "5." The child to whom the ball is tossed must give a combination making "5," as he catches, "3 and 2," etc.

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Pages 40-41. 6 inches by 8 inches is a good size. Large figures cut rom calendars should be neatly pasted on cards. Cutting may be done or seat work.

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Page 43. Teach meaning of ——— (blank), by using "what" or "how many."

After drill with the circle, the rest of the page may be used for silent reading or for seat work.

Pages 44-45. For the more immature children use a 6-inch instead of a 10-inch square, if you wish. Use for a seasonal picture, if "Birthday Gift" seems inappropriate.

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Game: Simon Says. Prepare cards each bearing one of the number problems of this page. Children stand in a ring around another player, who holds the pack of cards. He shows one card and calls on a player in the ring to *answer.* When the answer is correct all thumbs should turn up; if incorrect, all thumbs should turn down. The first pupil to turn thumbs down when a wrong answer is given, shows the cards the next time. (Cards should be large with calendar figures pasted on them.)

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Do not repeat a device until interest lags. Use new ones.

The teacher can sketch while listening. Snow flakes, that melt; balloons, that escape; flowers, that may be gathered; etc.

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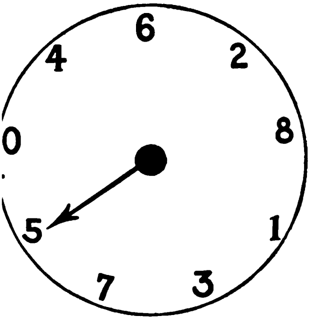

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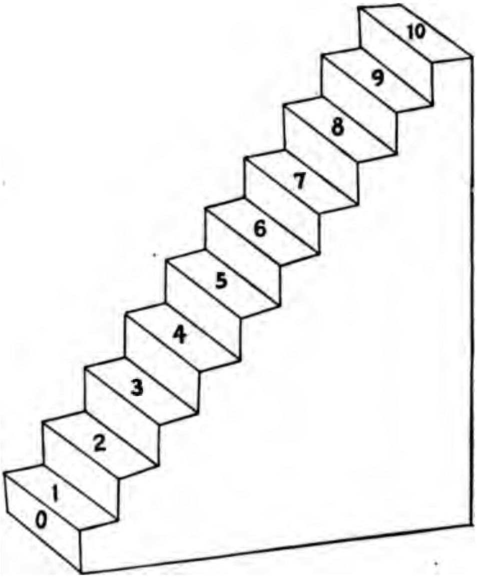

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Draw stairs on the blackboard, similar to the accompanying illustration. Ask pupils to go up these stairs as follows: Start on the floor and go up 2 steps at a time, e. g., 2, 4, 6, etc. Start on the first step and go up 2 steps at a time, e. g., 1, 3, 5, etc.

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Decorate your school room for Washington's Birthday, Flag Day, Memorial Day, or Columbus Day. Make chains of red, white, and blue paper. Chains for Thanksgiving should be orange and green.

Page 72. Make this seasonal, if it does not happen to be Christmas. Print the names of the months if calendars cannot be obtained.

Devices for drill on names of months.

1—Write the name of each month on a card. Place cards upon chalk tray. Children put heads down and close eyes while teacher removes a card. At a signal children look up, and try to find which month is missing.

2—The cards are placed as before. As the teacher points to a card the child gives the name of the month and tells the season to which it belongs.

On a large printed calendar mark in *red* these days:

New Year's Day
Washington's Birthday
Flag Day
Memorial Day
Fourth of July
Labor Day
Armistice Day
Thanksgiving Day
Christmas
Easter

Supplement the calendar work by teaching how many days in a month, how many weeks, how many days in a week, how many school days, and other number facts.

Pages 73-74. Name according to season. Teacher makes the cornucopia and wall pocket with the class, as she gives directions very slowly. Or she may draw a picture of each step on blackboard, making pictures larger, but keeping the proportion.

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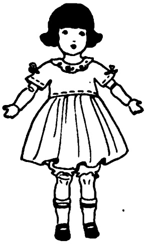
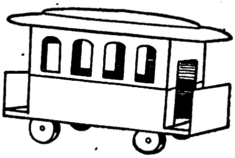


4 cents



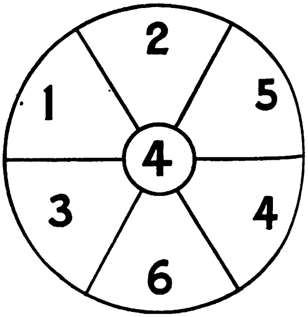
5 cents

From advertisements cut out pictures of toys, and mount them on cards, adding various prices. Allow child to buy two toys, one of which costs 4 cents. Tell the amount of the purchase.

Have pupils make problems, using 4's, e. g., shoes on horses, wheels of wagons, tires on automobiles, legs of animals, etc.

Page 77. Use in any way desired. For oral recitation each pupil may cover the written work below each domino with a piece of paper, and then give all the number facts that each suggests to him.

Game: Blind Man's Wheel. A player closes his eyes and points to the wheel, which has been drawn on the blackboard. If he touches a line the count is 0. After pointing he opens his eyes and adds 4 to *the number nearest* the end of his pointer.



Pages 78-79. See previous pages of similar nature.

Page 80. It may be well to take this up first on the blackboard, as the children are inclined to add the number above the line instead of making it the sum.

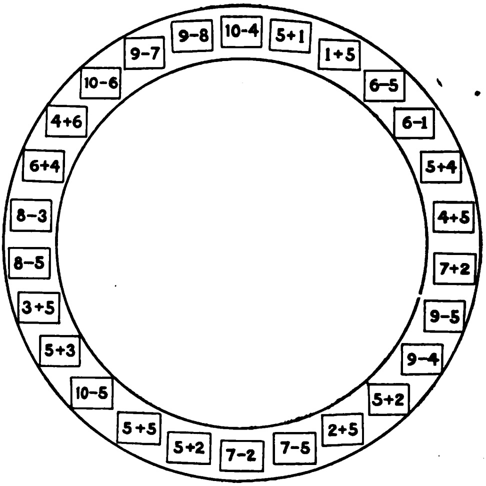
Game: What Is Missing? Teacher stands in the center of a circle. She gives a number which is to be the sum of two numbers, e. g., "9." Then she tosses a soft ball or bean bag to a child, at the same time giving one part of the combination that makes "9," e. g., "6."

The player to whom the ball is thrown should give the other part of the combination, e. g., "3," as he catches it.

When a player fails, he must stand within the ring, until he answers correctly when another makes a mistake.

Page 81. Children may well make this a socialized recitation. Let one child give the first answer, and then call on another child. The second child gives the next answer and calls on another, etc. Children must watch and correct each other's mistakes.

Device: The Ferris Wheel. The teacher may draw on the blackboard two large circles, one within the other. (See cut.) Between the circles draw small rectangles for cars, and write in each a number fact for drill. As teacher points, see who can ride around the wheel without making it stop. Of course the wheel stops whenever a pupil makes a mistake. See who can make the wheel turn the fastest by reciting the quickest.



Ten and Four	10 and 4	14

Pages 82-83. Real money or cubes, inch-squares, splints, and other objects, may be used instead of toy money.

Have cards containing words and figures. Lay on desk in proper relation. Copy on paper.

Page 84. See page 58. Give each child 20 counters (beans, beads, etc.) Arrange on desks in groups of twos. Count by 2's. How many 2's in 20? Arrange in threes. Count by 3's.

Count hands of 20 children by 2's; count hands of 18; count eyes of 16; count feet of 12; count 14 desks by 2's (touching them); count rows of desks by touching 2 rows at a time, etc.

Children form in 2 lines. Number one row with even numbers and one with odd numbers. Children having even numbers say them in series; e. g., 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, and back from 20. Children having odd numbers count by 2's; e. g., 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, and back to 1.

Dramatize the animals marching into Noah's ark. Let one corner of the room be the ark, and have the children go into it in pairs and in threes. Have pupil keep count of the number that enter.

Page 85. Let children tell other places where they have seen Roman numerals (Chapters in books, some watches, etc.).

Precede this page by blackboard lesson, changing words to figures or Roman numerals; or figures to words or Roman numerals; or Roman numerals to words or figures.

Page 86. *Devices.* Send a child from the room. Let him rap on the door a certain number of times. Players in seats count raps and run to the front of the room if they hold the number in any form.

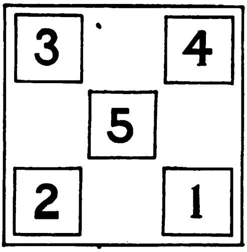
Players close eyes. The teacher taps. The children count the taps. Those holding cards with right number run forward and show them.

Page 87. *Practice* making first on drawing paper, using the picture book as a model. The children can do this for seat work. Later h child make a clock face on cardboard (6 inches by 6 inches) dividual practice in telling time. Ask such questions as "Which s a fast traveler?" "Which hand is a slow traveler?" "How can ll the hands apart?" "While the minute hand goes around the face, how far does the hour hand go?" etc. Give the children drill on placing the hands in different positions. Practice a few s each day until all the pupils can tell time.

ges 88-91. The children tell about their own day by the follow-ps.

Show the hour at which you get up in the morning.
Show your breakfast hour.
Show the hour at which school begins.
Show your lunch hour.
Show the hour at which school is dismissed.
Show your dinner hour.
Show the hour at which you go to bed.
Show the hour of *noon*.

ge 92. Perhaps some little girls can make gs for this game.
u may draw more than 2 circles and give ther values, or draw a large square con- smaller squares each having a certain



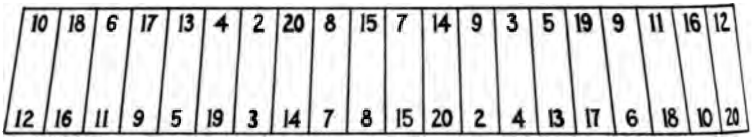
ge 93. Children may keep score in other Draw a scoreboard on one corner of the oard. Keep record of tardiness. How many children were tardy lay? How many today? How many more yesterday than today? nany tardy for a whole week? Add to see. Watch for improve-and commend. If none of the pupils are tardy, mark score with).

Page 94. Name other things bought by the dozen, e. g., eggs, bananas, oranges, rolls, cakes, cookies, buns, tarts, buttons, roses, carnations, etc.

Dramatize buying by the dozen, using number knowledge already acquired.

Pages 95-96. These two pages make good silent reading work. For drill on number facts the teacher may use the device which is given below.

Device. Run along this sidewalk by subtracting 2 from each number at the top of a block. Run back again by adding 2 to each number at the bottom of a block.



10	18	6	17	13	4	2	20	8	15	7	14	9	3	5	19	9	11	16	12
12	16	11	9	5	19	3	14	7	8	15	20	2	4	13	17	6	18	10	20

Page 97. *Socialized recitation.* Give each child a card like one of these. One child rises and says, "My card says 10 + 2. The answer is 12. What is the answer to your card, John?" John says, "My card says 15 — 2. The answer is 13. What is the answer to your card, Dorothy?" And so the recitation proceeds until all the children have been called on. Cards may then be exchanged. For quick drill, place all cards on the chalk tray. Have children read them, forward and backward. Keep score of perfect and imperfect recitations.

Page 98. Supplement by giving a pupil a number fact and asking him to make a story or problem about it. See the suggestions which were given for page 69.

Page 99. Make of newspaper. Call by seasonal name. Pupils cannot do this work with ease at their small desks. If possible, allow them to work in groups around a large table. Children may first practice making this with smaller piece of paper.

Pages 100-101. For variety, the teacher may read these pages to the children, having them listen carefully and then do the work. The result will show their ability to follow dictation. Use any available material. Drill on the number facts.

Page 102. Anticipate page 102 by collecting material during preceding weeks. The children will be delighted to bring toys to use in playing store.

Page 103. Children may draw pictures for seat work illustrating each step such as:

1. 00 00
2. 000 000

. 00 00 00

Write twos in columns.

Find the sum of two twos, three twos, four twos, five twos, etc

									2
								2	2
							2	2	2
						2	2	2	2
					2	2	2	2	2
				2	2	2	2	2	2
			2	2	2	2	2	2	2
		2	2	2	2	2	2	2	2
	2	2	2	2	2	2	2	2	2
2	2	2	2	2	2	2	2	2	2
—	—	—	—	—	—	—	—	—	—

Learn that two twos are four, five twos are ten, etc.

$$2 + 2 = 4$$
$$2 + 2 + 2 + 2 + 2 = 10$$

Then show the shortest way of writing the same thing.

$$2 \times 2 = 4$$
$$5 \times 2 = 10$$

Develop the table through addition and show that remembering a table saves a great deal of time. By this time the table of twos as far as twenty is familiar, and so notation, only, is new. Build table.

Pages 104-105. See suggestions for card game on page 97.

Games used previously for addition or subtraction can be varied to fit multiplication. Use flash cards.

Page 107. This might be Christmas, Hallowe'en, or Easter basket, or it might be the one Little Red Riding Hood carried to her grandmother. It might contain a dozen cookies and 2 pies. How many things? Etc.

Measure the row cut off. How many inches long? How many inches wide? Measure the part remaining. How many inches long? Wide? Measure handle.

Pages 108-109. Do not make as "valentines," if it is Christmas or June. Address envelopes to Father or Mother, or to anyone else. Buy stamps and place them properly on envelopes.

Page 110. It is important for each child to do this measuring, or to see it done. Allow him to discover the fact for himself, if possible, working before school or during an occupation period. Then write sentence containing the knowledge gained. Use measure or a quart milk bottle and a pint bottle.

Find out the cost of a quart bottle of milk. Tell cost of 2 quart bottles. Find cost of pint bottle. Tell cost of 2 pint bottles. How many glasses can be filled from the quart bottle? How many glasses can be filled from the pint bottle? If one pint fills two glasses, how many pints of milk will it take to give a glass to each child in your class?

We may write "pt." for pint or pints, and "qt." for quart or quarts.

Make a list of things sold by the pint and quart: vinegar, sirup, *molasses, oils,* cream, etc.

Dramatize a visit from the milkman.

Page 111. Divide many objects in the room into halves, such as a ile of books, a pack of paper, a box of pencils, etc. Divide the class nto halves, and see how many pupils are in each half. Fill a quart milk ottle with water and then pour one-half of it into a pint bottle. How much has been poured out? One pint is what part of a quart? Lead children to see that a quantity must be divided into two equal parts to find one-half of it, and that two halves make one whole.

Page 112. See pages 88-91. Supplement by using problems; e. g., John started on an errand at 4 o'clock and returned in a half hour. Turn hands to show the time when he started; when he returned.

Page 113. Prepare for this lesson by cutting strips of paper about 24 inches long. Give each child several strips. This lesson needs close upervision as the work should be accurately done.

Supplement by drawing lines and dividing into 2 equal parts. You ill see that this requires the knowledge gained through cutting and olding.

Page 114. See pages 54 and 102.

Use the toys that were on sale for page 102. Mark the prices the ame as the products of the table of 2's. Then sell for half of marked rice. Use toy or real money and tell the amount of purchase and the hange due.

Page 115. Strips may be cut from wrapping paper. Let children ark the half inches for seat work.

Page 116. It may be well to practice first with common paper, nd make a pattern. This badge could be used for Flag Day, Armistice ay, or for the birthday of a great American.

Page 117. *Seat Work:* Cut strips according to written directions n blackboard. Let each pupil make his own circle and recite from he same.

Game: Pussy Wants a Corner.

1. Players stand in two rows facing each other. Rows as far

apart as clear floor space will permit. One player stands in the center of the space between rows.

2. One row numbers by 2's, e. g.,

   2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24

3. The second row numbers in the same way, but starts at the other end of the line to count, e.g.,

   24, 22, 20, 18, 16, 14, 12, 10, 8, 6, 4, 2

4. The player in the center represents ½ of any of these numbers. Let him wear a big card labelled ½.

   2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24
   ½
   24, 22, 20, 18, 16, 14, 12, 10, 8, 6, 4, 2

5. The player in the center (½) calls a number, e.g., "24."

6. The two players whose numbers are ½ of that number (12) must immediately exchange places. The one in the center tries to get to either place as the twelves change.

7. The player left without a place must stand in the center.

Page 118. Pin the best flags to a tape and use to decorate the room. For language tell the story of the first flag. Make number stories about flags.

Page 119. This is usually a crowning achievement to the children. Correlate with a talk on hygiene.

Page 120. Anticipate and have children bring toys. See pages 68, 102, and 114.

Page 121. Supplement by using other material, cubes, inch-squares, pennies, nickels, or other objects.

Pages 122-123. Anticipate these pages by collecting material during preceding weeks, for a toy grocery store. Get sample packages, empty boxes, and containers of standard articles for stock. Children bring current prices from local stores. Make list of things sold by ounce and pound. Get scales if possible.

Page 124. The children probably have some preparatory knowledge of this page through having counted by tens and through learning the pages in their readers. Arrange counters on desks; e.g., 2 groups of 10 and one thing more make 21; 2 groups of 10 and 2 things more make 22, etc.

The teacher writes word names on the board (not in sequence), and the children copy, writing figures after each name.

Page 125. See devices pages 58, 84, 100.

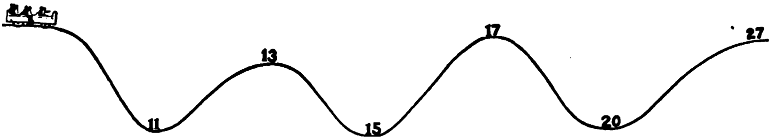
Count sides of triangles, count music beats, strokes of bell, etc.

Pages 126-127. Such pages as these form opportunities for judging a child's ability to interpret the printed page, a valuable and necessary phase of reading. They may well be used for silent reading.

Supplement by your own group of problems.

Page 128. See suggestions for previous pages of similar nature.

Device for drill: Giant Coaster. As a player rides, he adds his number (on car) to each number on the course; e.g., 3 and 11; 3 and 13; etc. When he fails, he falls and another player rides. Subtract in the same way.



Page 129. See suggestions for similar pages. Make price lists of different stores for drill in number facts.

Page 130. See pages 104, 105. Add more cards to the game to cover new number facts.

Page 131. Vary score numbers according to the pupils' ability.

Pages 132-133. See suggestions for page 110.

Have children make a list of things sold by dry measure. Get current prices from the grocery or fruit market and use in making up real everyday problems, such as the child must deal with when he runs errands.

Page 134. Another similar game: if sum is to be 9, one child may say, "I am 5;" another child (perhaps called upon by first pupil) must know what to put with 5 to make 9, and should say "4."

Page 135. See suggestions for page 111.

Page 136. See suggestions for page 113.

Page 137. See suggestions for page 114.

Pages 138-139. For motivated drill use the game played on 117; e.g., changing ½ to ⅓, and numbering the pupils accordingly.

Pages 140-141. In counting the tens, the names of the new numbers may be discovered by the child himself after a name or two is given by the teacher. For *two* tens we have the somewhat special name twen-ty (twain-ten), and for *three* tens, thir-ty; what name for *four* tens? For *five* tens? Let the pupil experience the joy of discovering something for himself. Each child should be provided with 50 wooden splints or toothpicks. Make bundles of ten each, etc.

Pages 142-143. These pages form a summary. To relieve the monotony of abstract drill introduce games and devices by adapting any that have been used for other pages.

Page 142. *Adding game.* Give to each child a card bearing one digit. A player runs quietly to the front and shows his card; e.g., "8."

As he shows card, he calls upon another player. The second player calls out the *sum* of "8" and the digit on his own card, which he does *not* show.

The player who first calls out "6," the unseen number on the second card, wins that card, (6). The player holding the most cards at the end of the game, wins.

Page 143. Use the game on page 105 for the multiplication tables and the game on 117 for division.

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